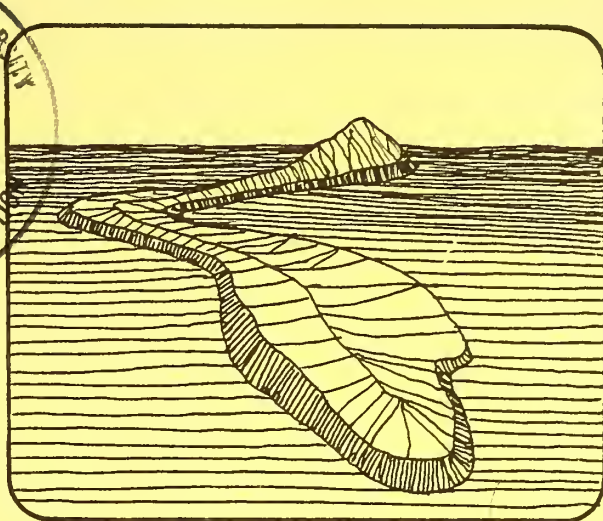
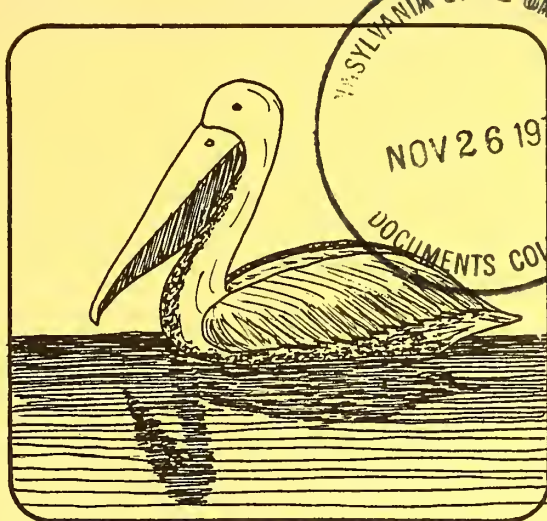
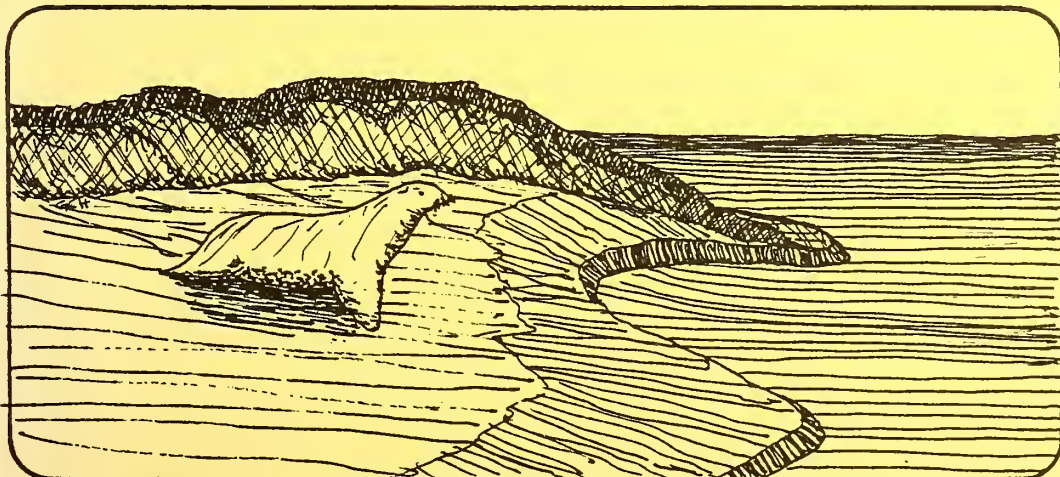
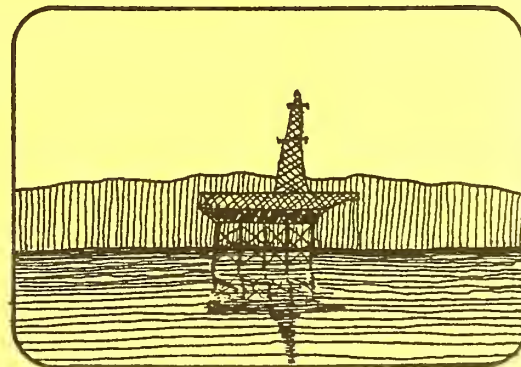
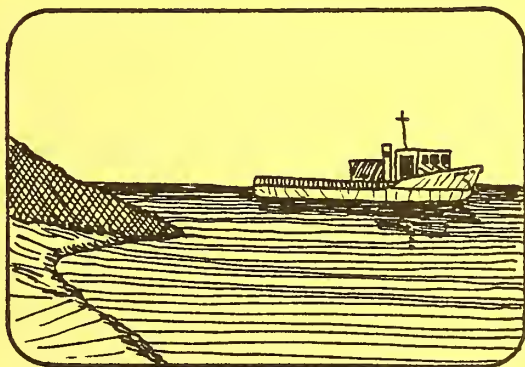



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DRAFT ENVIRONMENTAL IMPACT STATEMENT ON THE PROPOSED CHANNEL ISLANDS MARINE SANCTUARY





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DRAFT ENVIRONMENTAL IMPACT STATEMENT

Prepared on the Proposed Channel

Islands Marine Sanctuary

U.S. Department of Commerce
National Oceanic and Atmospheric
Administration
Office of Coastal Zone Management
3300 Whitehaven Street, NW
Washington, DC 20235

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B. Note to the Reader

The two major segments of this DEIS are Section E, the Description of the Affected Environment, which presents a review of the resources and activities in the Channel Islands area and Section F, Alternatives, which discusses the preferred alternative of designating a marine sanctuary and regulating certain activities, and five other alternatives including a status quo or no action alternative. Certain additional documentation is appended. Particular attention should be paid to the draft Designation Document and the draft proposed regulations presented in Appendix 1.

Citations are referenced in the text by the name of the author or source in parentheses. Section G, Literature and Personal Communications Cited, contains detailed information on both documentary references and personal communications.

C. Summary

Introduction

The Marine Protection, Research and Sanctuaries Act of 1972 (16 U.S.C. 1431-1434) authorizes the Secretary of Commerce, after consultation with appropriate Federal agencies, concurrence of the affected State, and Presidential approval, to designate ocean areas having distinctive conservation, recreational, ecological, or aesthetic values as marine sanctuaries. In 1977, the National Oceanic and Atmospheric Administration (NOAA) of the Department of Commerce sent out a nationwide letter asking for recommendations of sites appropriate for consideration as marine sanctuaries. The response included several different recommendations for the waters around the northern Channel Islands and Santa Barbara Island. The Resources Agency of the State of California recommended the waters extending 12 nmi (22km) around each of the eight Channel Islands, the National Park Service proposed the waters extending 8 nmi (14.8km) around the northern Channel Islands and Santa Barbara Island, and the County of Santa Barbara proposed the entire Santa Barbara Channel and the waters around the northern Channel Islands and over the Santa Rosa Plateau, but excluding State waters. In June 1978, the County of Santa Barbara followed up its recommendation with a formal nomination.

This Draft Environmental Impact Statement (DEIS) proposes the creation of a marine sanctuary in the waters around the northern Channel Islands and Santa Barbara Island extending 6 nmi (11.1km) seaward from the mean high tide line. The waters immediately around the islands support an extraordinary assemblage of marine mammals, numerous seabirds including the endangered brown pelican, and important fishery resources including kelp and shellfish (see

Section E for a discussion of the natural resources). Until recently, the waters around the islands have been left relatively untouched by human activity because of their distance from the populous mainland. Use of the Santa Barbara Channel is increasing, however, and additional pressures are being placed on these natural resources. Although some of the islands have been declared a National Monument, there has been no formal recognition of the national significance of the area's marine resources. Finally, although numerous State and Federal agencies have authority over some of the area's resources and activities, no coordinated management regime exists to insure the maximum protection and enjoyment of the area's resources.

To determine the desirability and feasibility of proceeding with the designation, NOAA has gathered and analyzed information and consulted with other Federal agencies, State agencies, particularly the California Coastal Commission (CCC), the Pacific Regional Fishery Management Council, and local interest groups. In April 1978, NOAA held a public workshop in Santa Barbara to discuss the sanctuary proposal. An Issue Paper on possible California marine sanctuary sites, including the Channel Islands, was circulated for review and discussion in December 1978. In February and March 1979, the California Coastal Commission (CCC) held regional and State hearings to solicit reaction to the possibility of a marine sanctuary near the Channel Islands. Based on public response and a recommendation by the CCC to develop a draft environmental impact statement (DEIS), NOAA prepared this DEIS which describes the proposed action to designate the sanctuary, including draft regulations on activities and uses. NOAA distributed copies of and solicited comments on a preliminary draft of the Description of the Affected Environment (Section E.) and an outline of five designation options and the status quo option in June, 1979. NOAA held public meetings in Santa Barbara and Ventura to discuss these

documents and answer questions about the program. The proposed designation and regulations do not represent a final decision; they are presented and evaluated in this DEIS for public review. NOAA has analyzed alternatives to this proposal including that of taking no action, all of which are discussed in section F. NOAA will receive comments on this DEIS, hold public hearings in Santa Barbara County and Ventura County, California, and respond to all comments received in a Final Environmental Impact Statement (FEIS). After review of comments and final consultation with Federal agencies, if a decision is made to proceed with the designation, NOAA must seek Presidential approval of the proposed marine sanctuary designation.

A draft Designation Document and a set of draft proposed regulations appear in Appendix 1. These documents describe the preferred alternative and will be published as a proposed rulemaking in the Federal Register concurrently with the distribution of this DEIS. Following publication, comments will be received for 60 (sixty) days after which, if a sanctuary is to be designated, final regulations will be published in the Federal Register to be effective upon designation, and an FEIS will be issued.

PROPOSAL TO DESIGNATE THE CHANNEL ISLANDS MARINE SANCTUARY

The Office of Coastal Zone Management, which is responsible for the marine sanctuary program within NOAA, proposes the designation as a marine sanctuary of the waters surrounding the northern Channel Islands and Santa Barbara Island, extending from the mean high tide water line on the four northern Channel Islands (San Miguel Island and adjacent rocks, Santa Cruz Island, Santa Rosa Island, and Anacapa Island) and Santa Barbara Island seaward 6 nmi (11.1km) (see Figure C-1). The exact boundary by coordinates is presented in an appendix to the proposed regulations.

Designation

The Designation Document (the draft Designation for the proposed Channel Islands marine sanctuary is presented in Appendix 1) serves as a constitution for the sanctuary. It establishes the boundary and purposes of the sanctuary, identifies the types of activities that may be subject to regulations, and specifies the extent to which other regulatory programs will continue to be effective within the sanctuary. The Designation requires the approval of the President. Its content can be altered only after repeating the entire designation process and securing Presidential approval.

If the designation is adopted, the following activities will be subject to necessary and reasonable regulation:

- oil and gas operations
- discharging or depositing any substance
- alteration of or construction on the seabed
- navigation and operation of vessels (other than fishing and kelp harvesting vessels) and aircraft overflights below 1000 ft (305m)
- removing or otherwise deliberately harming cultural or historical resources

The proposed restrictions on these activities are set forth in the draft regulations. NOAA may legally promulgate regulations only in relation to the specific activities listed in the designation document. Article 5 of the draft Designation specifically exempts fishing activities from sanctuary regulation, except that fishing vessels may be regulated with respect to discharges.

Proposed Regulations

The proposed sanctuary, presented in detail in Section F.2 and summarized here, would subject the above listed activities to sanctuary regulations.

Specific regulations are proposed as reasonable and necessary for the protection of the natural resources. They are not intended to duplicate existing regulations. To the extent possible, the sanctuary managers will coordinate with existing authorities in both the administration and enforcement of the regulations. These regulations will apply only within the sanctuary boundaries. The full text of the proposed regulations as they will appear in the Federal Register is presented Appendix 1.

The proposed regulations would impose the following controls:

--Hydrocarbon operations

The proposed regulation prohibits any activity for the exploration or exploitation of hydrocarbons (oil and gas) anywhere in the sanctuary pursuant to leases executed on or after the effective date of these regulations. Exploration and development pursuant to leases predating the effective date of the regulations and the construction of pipelines are allowed subject to all proposed sanctuary regulations and all regulations and conditions imposed by the following entities: the Department of the Interior, the U.S. Coast Guard, the Corps of Engineers, the Environmental Protection Agency, the State of California under the Federal consistency provisions of the Coastal Zone Management Act, and any other State or Federal authority. This activity is permitted subject further to the requirement that certain oil spill contingency equipment is present for such operations (see Section F.2.b.1). This regulation is designed to reduce the risk of contamination of the nearshore resources by spilled oil, and to protect the island shores from visual and acoustic disturbances.

--Discharges

The proposed regulation prohibits discharges into the sanctuary. Indigenous fish waste and chumming materials, effluents from marine sanitation devices, nonpolluted cooling waters from ocean-going vessels, and effluents incidental to allowed hydrocarbon operations regulated by the standards imposed in an NPDES permit are exempted from this regulation. Discharges from foreign flag

vessels are also prohibited to the extent consistent with international law. The prohibition on discharges and littering will help maintain the water quality in the sanctuary and prevent aesthetic degradation. The exemptions insure that this regulation will not prevent activities consistent with the goals of the sanctuary.

--Alteration of, or construction on, the seabed

The proposed regulation prohibits dredging, drilling, constructing on, or altering the seabed within 2 nmi (3.7km) of the islands. This prohibition offers a buffer for sensitive nearshore resources, particularly marine mammals and seabirds but also benthic organisms, from the visual, acoustic, and pollution/sedimentation disturbances associated with seabed alteration.

--Vessel traffic and overflights

The proposed regulation prohibits the passage of U.S. flag and, to the extent consistent with international law, foreign vessels within 1 nmi (1.8km) of the islands to protect sensitive nearshore resources from disturbance and possible oil spills or discharges resulting from groundings, collision, or normal operation. This restriction also serves to decrease congestion in nearshore zones. Fishing, kelp harvesting, recreational, research, military, and enforcement vessels are exempted from this prohibition.

To insure that sensitive nearshore resources, particularly marine mammals and seabirds, are not unnecessarily disturbed, overflights of less than 1000 ft (305m) are prohibited within 1 nmi (1.8km) of the islands. Military search and rescue, and enforcement opera-

tions, kelp harvesting surveys, and access to the islands are exempted from this regulation.

--Historical or cultural resources

Removing or damaging historical or cultural resources is prohibited.

Environmental and Socioeconomic Consequences of the Proposed Action

These regulations will provide increased protection for the special resources around the islands, particularly marine birds and mammals, and will also insure the long-term continuation of existing safeguards, as described below. At the same time, the regulations attempt to minimize potentially adverse economic impacts.

The prohibition of petroleum operations on leases acquired on or after the effective date of the sanctuary regulations will allow the sanctuary to act as a partial buffer between the effects of petroleum development and the nearshore resources. Sanctuary resources that are particularly vulnerable to spilled oil and to human activity associated with normal petroleum operations and oil spill cleanup attempts will thereby be protected from increased activity levels in the future.

The 6 nmi (11.1km) buffer provides increased time and distance for natural forces to weather and volatilize oil spills and other discharges before they reach nearshore communities. The buffer also increases the available response time for at-sea cleanup and oil spill containment, and if nearshore cleanup becomes necessary, allows a longer planning period; nearshore cleanup activities may otherwise be even more damaging than the oil itself. The buffer reduces the visual and acoustic disturbances of petroleum development which may affect marine mammals, seabirds, and the aesthetic qualities of the islands. Finally, the buffer will insure the continued integrity of California's oil and gas sanctuaries and prevent the potential need for a drainage sale with associated disruption and potential damage to nearshore resources.

This provision does not affect activities pursuant to leases within the sanctuary which predate the effective date of the regulations and are partially or wholly within the proposed sanctuary. While the majority of tracts wholly or partially inside the proposed sanctuary were withdrawn from Lease Sale #48 (which occurred June 29, 1979), the regulation facilitates the long-term protection of the area from activities occurring elsewhere. NOAA will seek the cooperation of the Department of the Interior to insure that the tracts affected by the prohibition are not offered for lease. If petroleum reserves exist in these areas which cannot be tapped from outside the sanctuary, these reserves will be foregone. In February 1979 the U. S. Geological Survey (USGS) estimated that there were 5.7 million barrels of oil and 8.9 billion cubic feet of gas underlying 24 tracts in the proposed sanctuary which the Secretary of Interior withdrew from Lease Sale 48. USGS later drastically reduced its lease estimates for the sale area, but newer estimates are not available for those 24 tracts. No reliable data are available on the amount of petroleum underlying the entire proposed sanctuary. Past exploration in the

area has proven negative, but that does not preclude the possibility of recoverable reserves.

The 6 nmi (11.1km) buffer created by the prohibition on oil and gas activities does not provide complete protection from the adverse effects of petroleum operations: first, in a marine environment the transport of substances from one location to another is inevitable; and secondly, operations on existing leases are allowed in the sanctuary in order to minimize the economic impact of the sanctuary and the burden on the lessees. The proposed regulations allow development of existing leases in accordance with other sanctuary regulations and all conditions imposed by existing authorities. The requirement for certain additional onsite oil spill containment equipment will probably not place large additional cost on the industry, particularly since in many cases similar equipment may also be required by the State of California under the consistency provisions of the Coastal Zone Management Act.

The prohibition of discharges will enhance the area's aesthetic features by lessening levels of litter thrown overboard and will reduce the threat that the living marine resources in the sanctuary will swallow potentially harmful trash. The economic impact of this regulation on sanctuary users is minor, although they will be required to retain their trash for proper disposal on land. The regulation supplements existing and anticipated prohibitions of discharges of oil and hazardous substances within 50 miles of the nearest land.

The impacts of prohibiting seabed alteration and construction are expected to be minor since all current dredging occurs outside the sanctuary and there are no dredge spoil disposal sites within the sanctuary.

The regulation prohibiting most commercial vessels from the waters within 1 nmi (1.8km) of the islands will probably have minimal economic impacts because the affected vessels generally remain in the vessel traffic lanes and thus well away from near-shore areas.

Since military and enforcement operations, kelp surveys, and landings on the islands are exempted from the overflight prohibition (and commercial aircraft fly much higher), the prohibition on flying below 1000 ft (305m) within 1 nmi (1.8km) of the islands will primarily affect recreationists observing area resources, especially whales. Whales can, however, be viewed from altitudes greater than 1000 feet (305m).

The environmental and economic consequences of prohibiting the removal or damage of historical or cultural resources should be minimal. More precise estimates of the consequences will be possible after all identified resources are mapped.

NOAA's preferred marine sanctuary and the proposed regulations will not prohibit operations because of emergency or military operations necessary to the national defense.

Management of the marine sanctuary will be designed to preserve the resources of the waters surrounding the northern Channel Islands and Santa Barbara Islands in their present relatively undisturbed state. By integrating education, environmental monitoring, and compatible use regulations into a coordinated management strategy, NOAA will try to insure that the public can derive maximum benefit from the marine sanctuary with a minimum of environmental damage. A detailed management plan will be developed following designation of the sanctuary.

Enforcement and surveillance will be an integral part of the management and protection of the Channel Islands Marine Sanctuary. NOAA is exploring various means of providing enforcement and surveillance; the National Marine Fisheries Service, the U.S. Coast Guard, the National Park Service, and the California Department of Fish and Game (DFG) have experience in such operations so NOAA will further explore the possibility of cooperative management with each of these agencies. The participation of any enforcement agent will, of course, be subject to continuing discussions and will be affected by the precise scope and content of the final regulations, as well as by other demands and priorities facing NOAA and the other agencies involved.

If a sanctuary is established, NOAA will emphasize the national importance of the sanctuary's resources. NOAA will establish a Sanctuary Information Center and will promote the public's awareness of sanctuary resources through brochures and other techniques. NOAA will encourage and seek to coordinate research within the sanctuary. Such coordination will not only help to improve the data base on area resources and stimulate information exchange, but also may help to eliminate inefficient duplication of research and close data gaps. Sanctuary management may also

improve public access to research information. Researchers will be encouraged to notify the Sanctuary Information Center of intended activities and to file reports and results with the Information Center. Finally, both resource quality and effects of human activities in the sanctuary will be monitored. These results should aid in further upgrading the management system whenever necessary.

Marine Sanctuary Permits

Marine sanctuary permits, issued by NOAA, will be required for any activity which would otherwise violate the regulations and may be granted only if the activity will serve research or educational purposes. The permit procedure is specified in the regulations (Appendix 1).

Certification of Other Permits

The regulations propose to certify in advance any permit, license, or other authorization issued pursuant to any other authority within the sanctuary as long as the activity does not violate marine sanctuary regulations. This notice of validity avoids duplicating permit delays and costs where there is no violation.

D. Purpose and Need for Action

NOAA proposes that, as an area of exceptional value threatened by mounting development and use pressures, the waters offshore of San Miguel, Santa Rosa, Santa Cruz, Anacapa, and Santa Barbara Islands deserve special recognition, protection, and management as a marine sanctuary.

Located at the confluence of two major biogeographic coastal provinces in an area of exceptionally high biologic productivity on a submarine ridge possessing a wide variety of open water marine habitat, the Santa Barbara Channel and vicinity, the waters around the northern Channel Islands and Santa Barbara Island support a large and varied array of significant natural resources.

Among the resources found at the northern Channel Islands and Santa Barbara Island is one of the largest and most varied assemblages of pinnipeds in the world. The waters surrounding the islands serve as feeding grounds for six species of seals and sea lions including one species (the Guadalupe fur seal) which has been proposed for listing as an endangered species. In addition, numerous species of whales and dolphins migrate through the area, including several endangered species. A large number of marine birds also depend on the waters around the northern Channel Islands and Santa Barbara Island. The islands serve as rookery areas for 9 of the 12 species of nesting marine birds found in the Southern California Bight, and the surrounding waters provide an essential foraging and rafting area for resident and transient species. Marine fish, algae (particularly kelp beds), and intertidal habitats also comprise a major component of the ecosystem in the northern Channel Islands. Finfish, shellfish, and

kelp found in the area have exceptional ecological, recreational, and commercial value.

With this concentration of highly productive, diverse, and rich living resources in a relatively small geographic area, the waters around the Channel Islands are also of high research value. Extensive studies of these marine areas have been conducted.

The recreational opportunities in the waters surrounding the northern Channel Islands and Santa Barbara Island include pleasure boating, skin diving, sportfishing, and nature studies such as bird and mammal watching.

Until recently, the island waters maintained relative isolation from activities which could affect them, primarily because of their distance from the mainland. Therefore, formal recognition of the particular value of these waters to marine mammal, marine bird, fish, kelp, and intertidal communities, and to recreational and research activities was not needed. Various agencies regulated specific uses of the waters, but the establishment of a comprehensive management system to protect these waters was not required. More recent and ever-increasing development and use, however, have made the reliance on geographic remoteness insufficient to avoid increased pressure upon and potential harm to the components of this rich ecosystem.

Although the Secretary of the Interior withdrew 24 tracts within 6 nmi (11.1km) of the islands from Lease Sale 48, pressure for expanded offshore oil and gas development in the Santa Barbara Channel and around the Channel Islands is likely to increase. Several tracts within 6 nmi (11.1km) of the islands were leased in

Sale 35, and unless the area is given special status, future lease sales (Sale #68 in 1982 and Sale #73 in 1983) are likely to include nearshore areas. New drilling and redrilling for oil and gas is being planned on several existing leases near the islands.

The Channel also have become an important commercial shipping area with use levels expected to increase as additional tankers bring oil and liquid natural gas (LNG) into southern California ports. Specifically, the movement of oil from the Elk Hills Petroleum Reserve and from drilling platforms in the Channel, as well as the potential development of an LNG terminal in the Channel region, may significantly increase tanker transport of oil and hazardous substances through the Santa Barbara Channel. The shipment of rocket boosters and external tanks to Vandenberg Air Force Base for the Space Shuttle Vehicle System will increase the number of barges transitting the Channel.

Commercial fishing activity, already firmly established around the northern Channel Islands, will continue and possibly increase in intensity as market demands for fish expand. With a growing southern California population, the area has also become more frequently sought out as a recreational resource. Because of the area's varied recreational potential and the paucity of undisturbed natural marine settings elsewhere in the region, the demand for recreational opportunities will grow. Finally, the Department of Defense, particularly the U.S. Navy, uses much of the Channel and Channel Islands area for various training and testing activities.

In summary, increasing development within the Channel and in the waters surrounding the northern Channel Islands is gradually eroding the buffer of isolation that previously protected the area's outstanding natural resources, and pressures are likely to

continue growing in the future. Therefore, some form of special protection is desirable in order to ensure that the extraordinary wealth of natural resources in the area is not jeopardized,

Although many agencies currently regulate or have authority over specific activities and particular natural resources of the island waters, no single authority has responsibility for monitoring the entire system and acting to protect that system. Consequently, the impacts of each activity which might affect the resources are evaluated separately, and cumulative impacts may be overlooked. In addition, the existing authorities have limited resources for enforcement, and marine sanctuary designation may supplement the administration of current safeguards.

Furthermore, the waters around the islands have no formal recognition of their special environmental value. In some cases, it may be in the general public's interest to allow activities which may pose threats to the environment, such as the siting of an LNG terminal. Such decisions, however, must be balanced against the region's important resources. In the absence of formal recognition of the importance of the waters around the Channel Islands, there is no assurance that the existing authorities will adequately consider the particular value and vulnerability of this vital habitat.

Currently, there is no provision for comprehensively monitoring the effects of human activities in the area. Without some provision for study and monitoring, it is impossible to act in a manner insuring the long-term protection and preservation of the marine resources of the waters near the islands.

The designation of a marine sanctuary in these waters would create a system responsible for assessing the overall impacts of activities in the area. More formal acknowledgement of the special value of the area would insure that it is given special protection, consideration in an overall planning sense, and would encourage particularly careful review of any proposals for future siting of potentially harmful activities nearby. Finally, monitoring and study of the sanctuary would provide the basis for a greater understanding of the area's needs and ecological balance and would provide the foundation for better management.

In light of the identified needs, the proposed sanctuary would have the following objectives:

1. To ensure that human uses and activities within the proposed sanctuary boundaries do not: (a) degrade intertidal habitats or foraging, resting, migratory, or other open water habitat areas of value to marine birds and mammals; or (b) otherwise threaten the continued health, stability, diversity, or numbers of seabird or marine mammal populations using sanctuary waters.
2. To encourage scientific research consistent with objective 1 on the significant resources of the area which will contribute to the understanding of ecologic relationships and to the resolution of management and regulatory issues.
3. To encourage low intensity recreational use consistent with objective 1 and with the island-based recreational objectives established by the National Park Service and other Island landowners.

E. DESCRIPTION OF THE AFFECTED ENVIRONMENT

E.1. General Overview of the Nominated Area

E.1.a. Location

The ocean area currently under investigation lies within the northern portion of a regional coastal ocean area commonly referred to as the Southern California Bight (see Figure E-1). This area (also referred to below as the study area) includes the Santa Barbara Channel and the waters surrounding the four northern Channel Islands of San Miguel, Santa Rosa, Santa Cruz, and Anacapa as well as Santa Barbara Island. The shoreward boundary of the area under consideration extends to the upper limit of high tide. A set seaward boundary was not established for purposes of assessing environmental resources, but specific boundary alternatives are developed in Section F based upon this assessment of the affected environment.

This area was selected in large part because of the extraordinary concentration of the following resources: 1) marine mammals; 2) seabirds; 3) fish, shellfish, and kelp resources; 4) intertidal organisms; and, to a lesser extent, 5) archaeologic/historic resources. Accordingly, each of these resource categories is addressed separately in Section E.2. Human activities in areas near these resources are discussed in Section E.3.

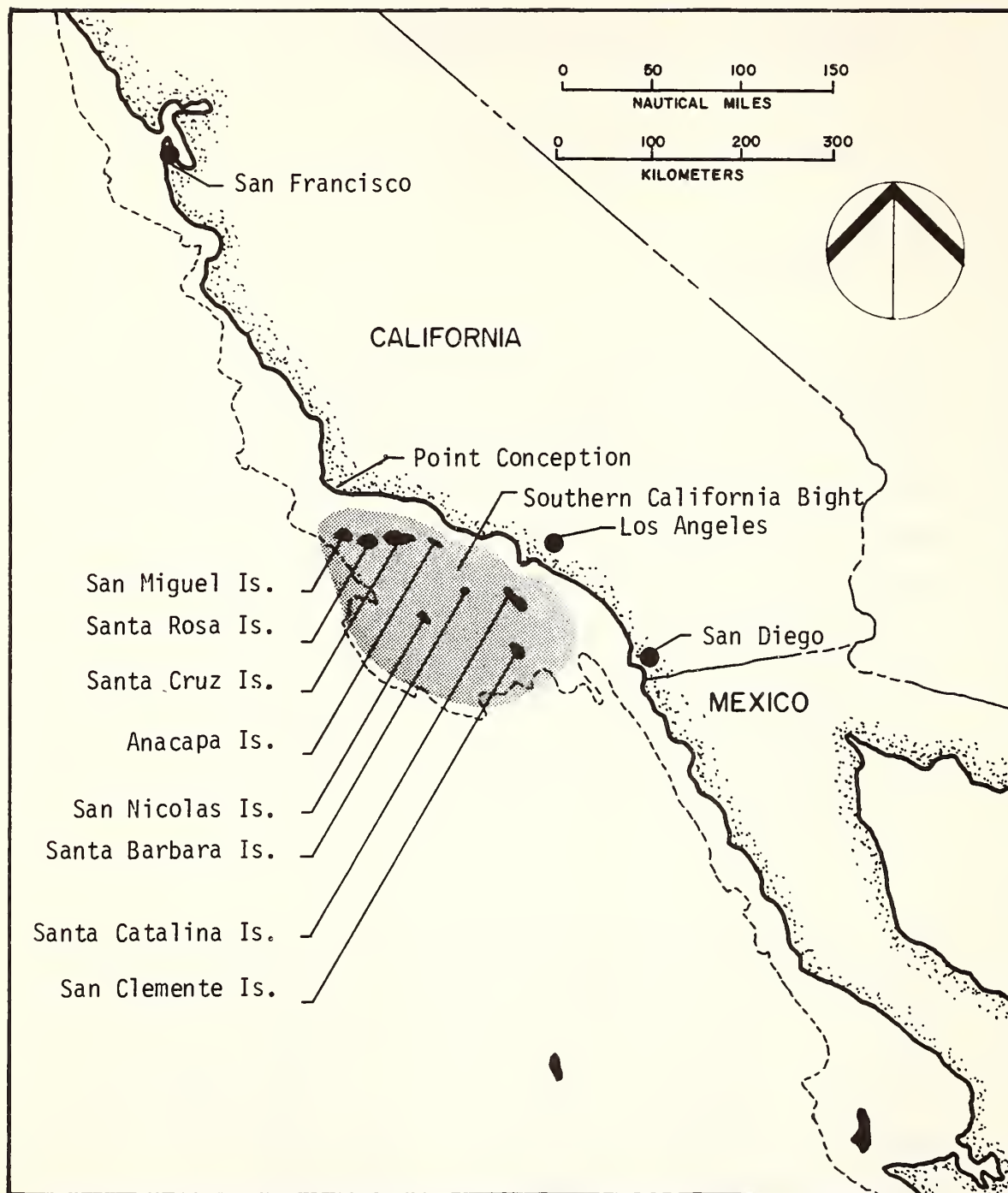


FIGURE E-1. Location of the Southern California Bight

E.1.b. Environmental Setting

Prior to reviewing each of the above-listed resource categories, it is necessary to recognize the significance of the broader ecologic system which supports and influences the localized resource assemblage. This entails a basic understanding of the role and importance of intricate physical and biological processes which link resources to the regional environment.

A basic premise to this or any sanctuary area is that a sanctuary cannot be a self-contained environmental unit whose living natural resources are independent of broader environmental conditions. The sanctuary can, however, describe an area whose natural conditions, as influenced by surrounding environmental processes, permit the site to serve as a focal point for biologic activity or resources of special significance. The following discussion briefly highlights some of the most important region-wide processes, conditions, and pathways which serve to influence the significant resources concentrating within the Channel Island shelf marine environment.

Perhaps the most significant aspect of the northern Channel Islands is their location at a major transition point between two biogeographic coastal provinces. Stretching along the coast to the north from Point Conception to Alaska is a biologically rich cold-temperate province referred to by Hedgpeth (1975) as the boreal-antiboreal littoral province. To the south from Point Conception to the lower third of Baja California in Mexico is a warm-temperate area referred to by Briggs (1974) as the San Diego biogeographic province. The biota of this transition zone includes a large number of cold temperate species from the north and tropical species from the south, as well as a large number of

endemic (or regionally limited) species.

The importance of Point Conception as a major marine biogeographic boundary is well documented. Briggs (1974) cites several investigators who note that this California point lies at a significant biogeographic boundary for many species of fish, and invertebrates such as bryozoans* and mollusks. In addition, the point is also a significant boundary area for several species of marine mammals and seabirds. The area marks a northern breeding limit for some warm-temperate species and a southern breeding limit for certain northern cold-temperate organisms. Located directly in this transition area, the northern Channel Islands area possesses a unique and extraordinarily rich species assemblage.

Two of the major factors contributing to the creation of this biologic transition area are the area's geomorphology and current patterns (see Figure E-3). At Point Conception the coastline turns sharply to the east while the edge of the outer continental slope offshore continues in a generally south-southeasterly direction. The California Current, which carries cold water down from the north, sweeps along the shoreline in a meandering south-easterly direction. When the current reaches the Point Conception promontory, this direction of flow carries the current away from the shoreline and thus induces a large eddy (gyre) effect in the Southern California Bight area. The return flow, carrying waters through the Channel Islands toward the shore in a northeast to northwesterly direction, is called the Southern California Countercurrent. Both the California Current and the Countercurrent are surface currents extending about 328 ft (100m) deep. The current gyres in the Southern California Bight circulate both

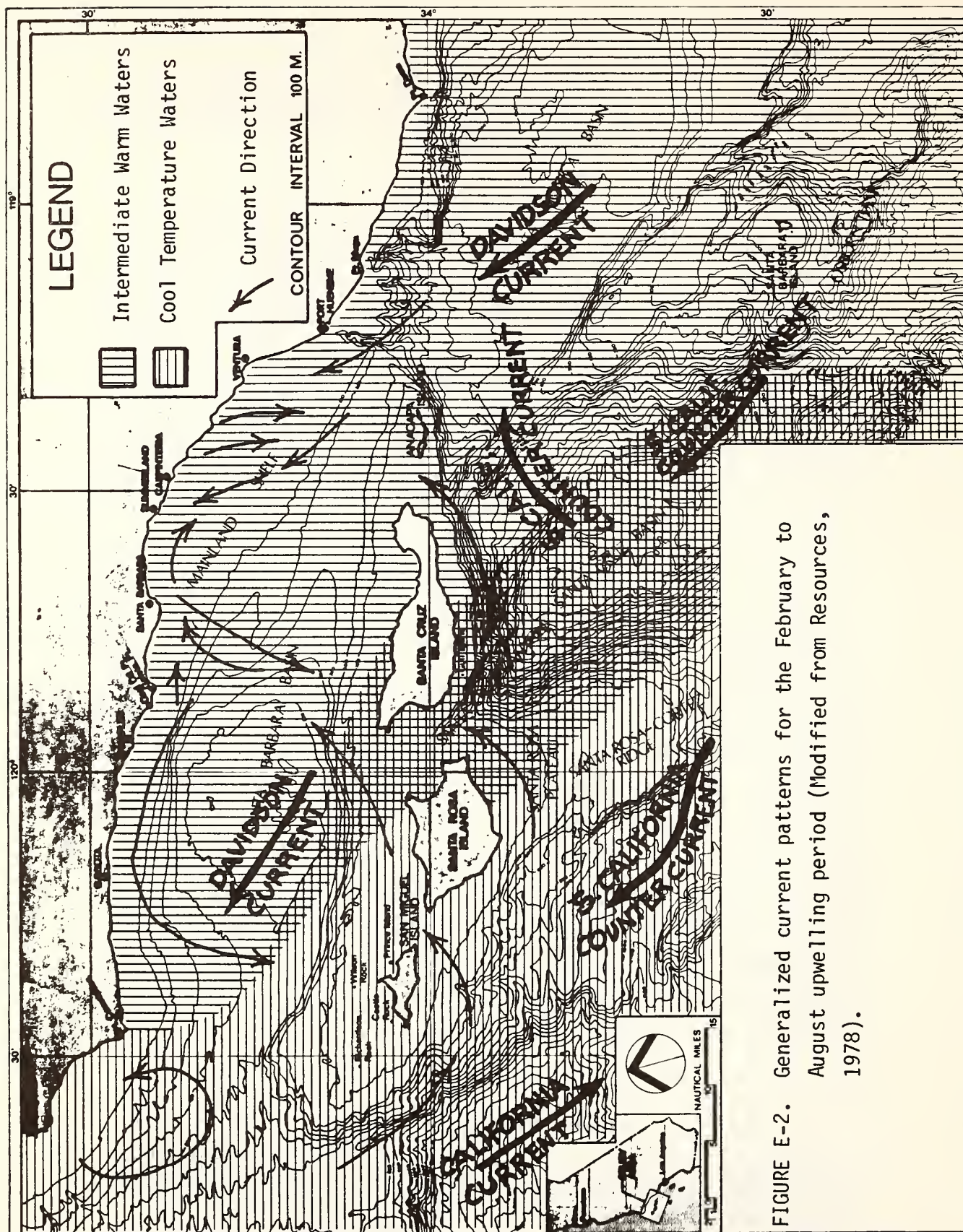
*Bryozoans include many of the small marine organisms commonly seen encrusting submerged rocks, pilings and other solid substrates.

nutrients and pollutants throughout the areas and thus provide a major force tying the conditions in the northern Channel Island area to those of the broader region.

During the course of a year, surface currents in the Southern California Bight undergo three distinct changes: an oceanic period from July to November; a Davidson Current period from November to mid-February*; and an upwelling period from mid-February through August during which nutrient rich deep waters are drawn to the surface. The current patterns characterizing these periods have been reviewed by the U.S. Bureau of Land Management (1979) and are graphically presented in Figures E-2, E-3, and E-4.

During the spring, when day length and light intensity are increasing, the high nutrient levels in surface waters foster exceptionally high primary production (phytoplankton and other plant growth). High primary production increases the food supply for other marine animals and thereby supports greater numbers of fish, shellfish, and other marine life than would otherwise be possible. Patches of upwelling occur in a sporadic fashion during this late winter-early summer period; the waters off Point Conception are particularly prominent as an upwelling center (U.S. Bureau of Land Management, 1979). Water current gyres throughout the Southern California Bight as well as species movement serve to distribute the high productivity benefits of this phenomenon beyond the localized upwelling patches and throughout the southern California coastal area.

*The Davidson Current is a northwesterly flowing mid-water current which rises to the surface along the southern California coast during this time of the year.



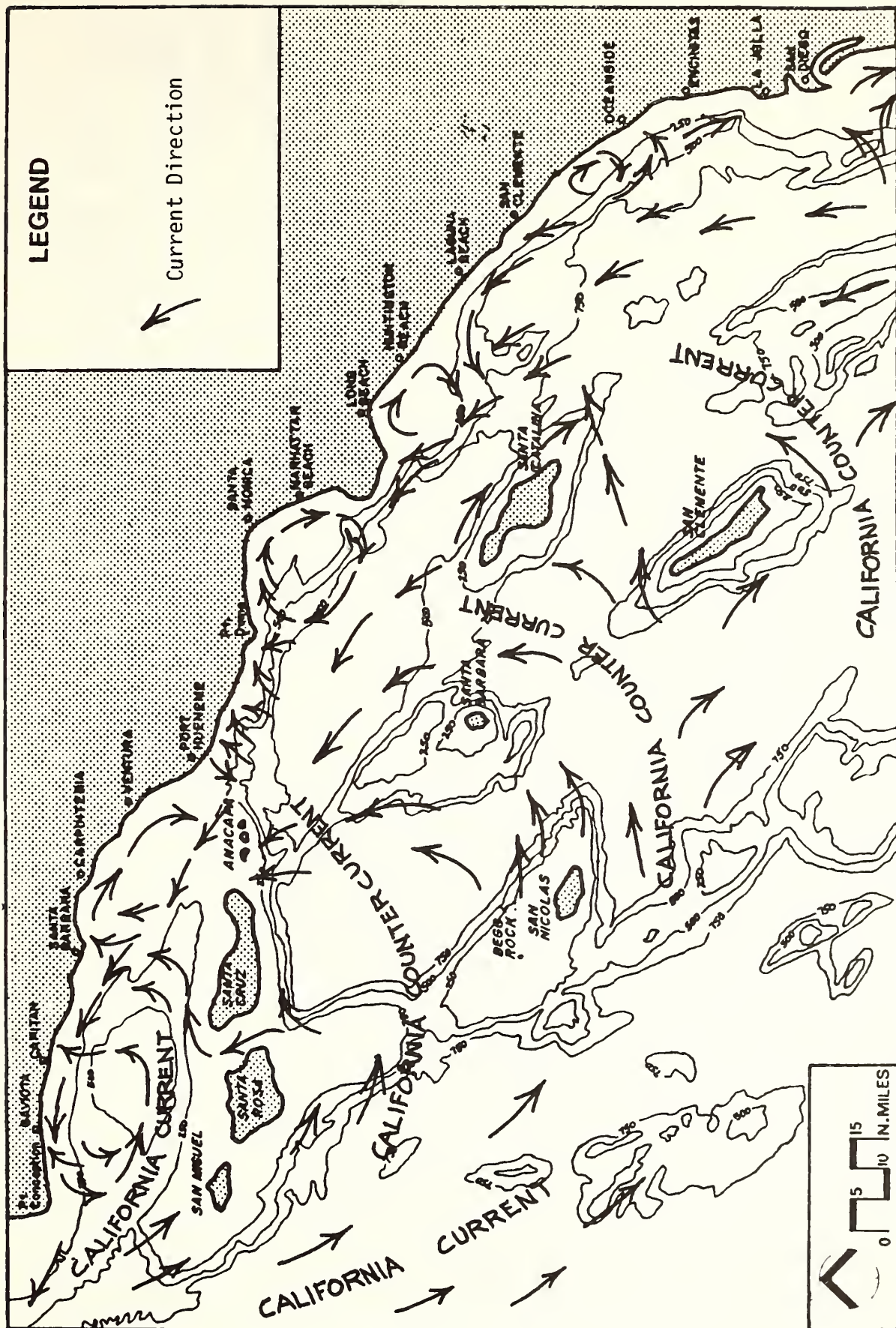
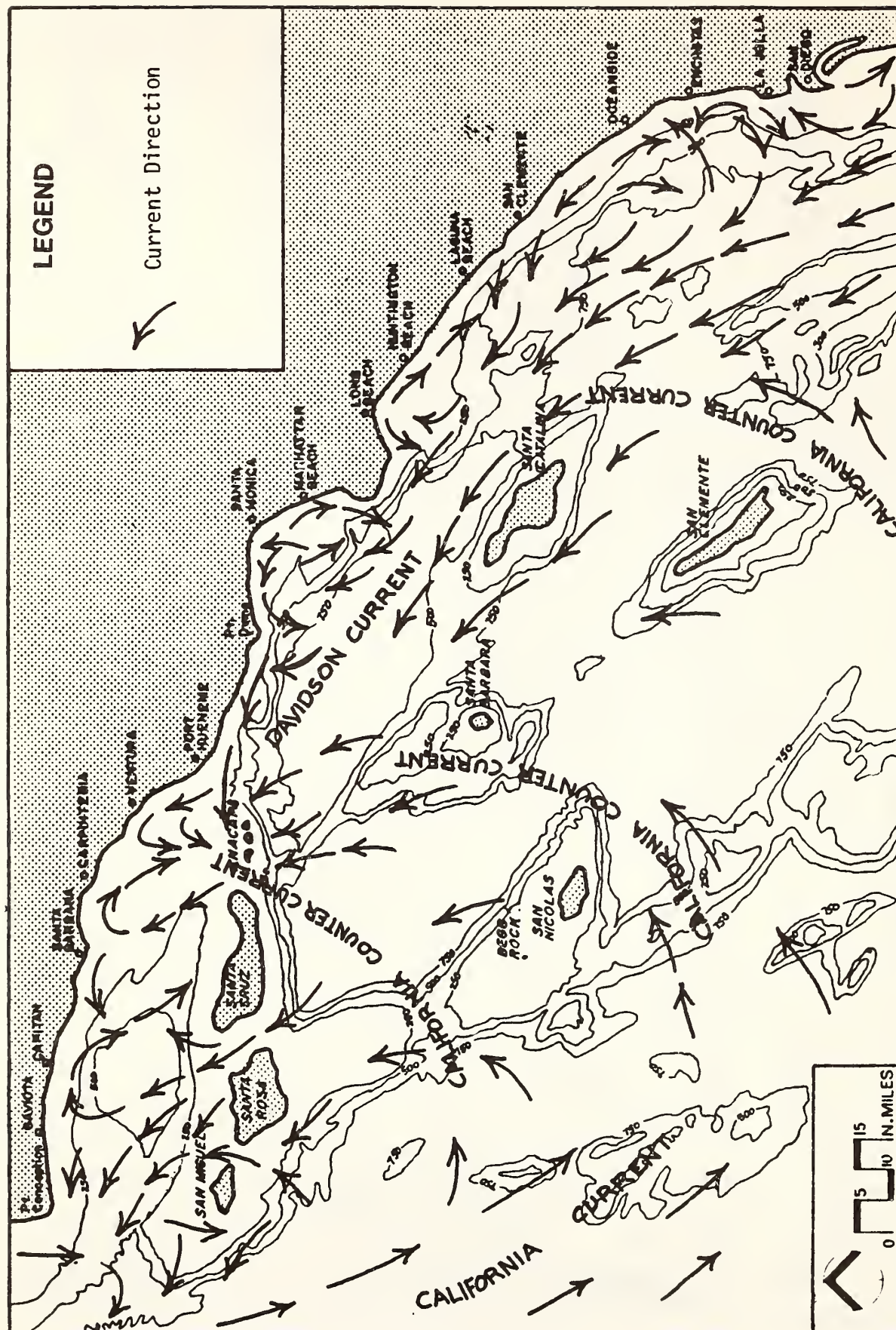


FIGURE E-3. Generalized Southern California Surface Currents for Oceanic Period (Modified from U. S. Bureau of Land Management, 1979).



Another extremely important feature of the Southern California Bight and the northern Channel Islands area in particular is the accentuated bottom relief and varied bottom substrate. The northern Channel Islands and Santa Barbara Island are actually peaks of extensive offshore ridges. A relatively shallow island shelf extending to a depth of about 330 ft (100m) surrounds the islands, usually extending from 5 to 10 nmi (8 to 16km) from the island coast. At this depth the bathymetry either plunges steeply to a deep coastal basin perhaps 1600 to 3300 ft (500 to 1000m) in depth (such as to the north of the northern Channel Islands) or slopes more gradually to the peak of a submerged ridge perhaps 600 to 1200 ft (180 to 350m) in depth (such as to the southeast of Santa Rosa Island) (see Figure E-5).

The abrupt change in depth provides a spectrum of marine habitats which support a wide diversity of benthic and other marine organisms. As cited in the U.S. Bureau of Land Management (1979) Final Environmental Statement on OCS Sale #48, Jones and Fauchauld (1976) indicate that "... the single most important environmental variable governing the distribution of (benthic) species within (the Southern California Bight) sampling areas was depth." Although depth may be the most important factor contributing to the area's diverse benthic communities, a gradation of substrate material from soft muddy deep-water trenches to sandy island shelf flats to rocky submerged outcrops also adds a significant dimension to the bottom species diversity. Finally, and as described further in Section E.2, the number of species and abundance of both bottom living and mid-water species increases dramatically as the depth decreases from deep coastal basins to island shorelines.

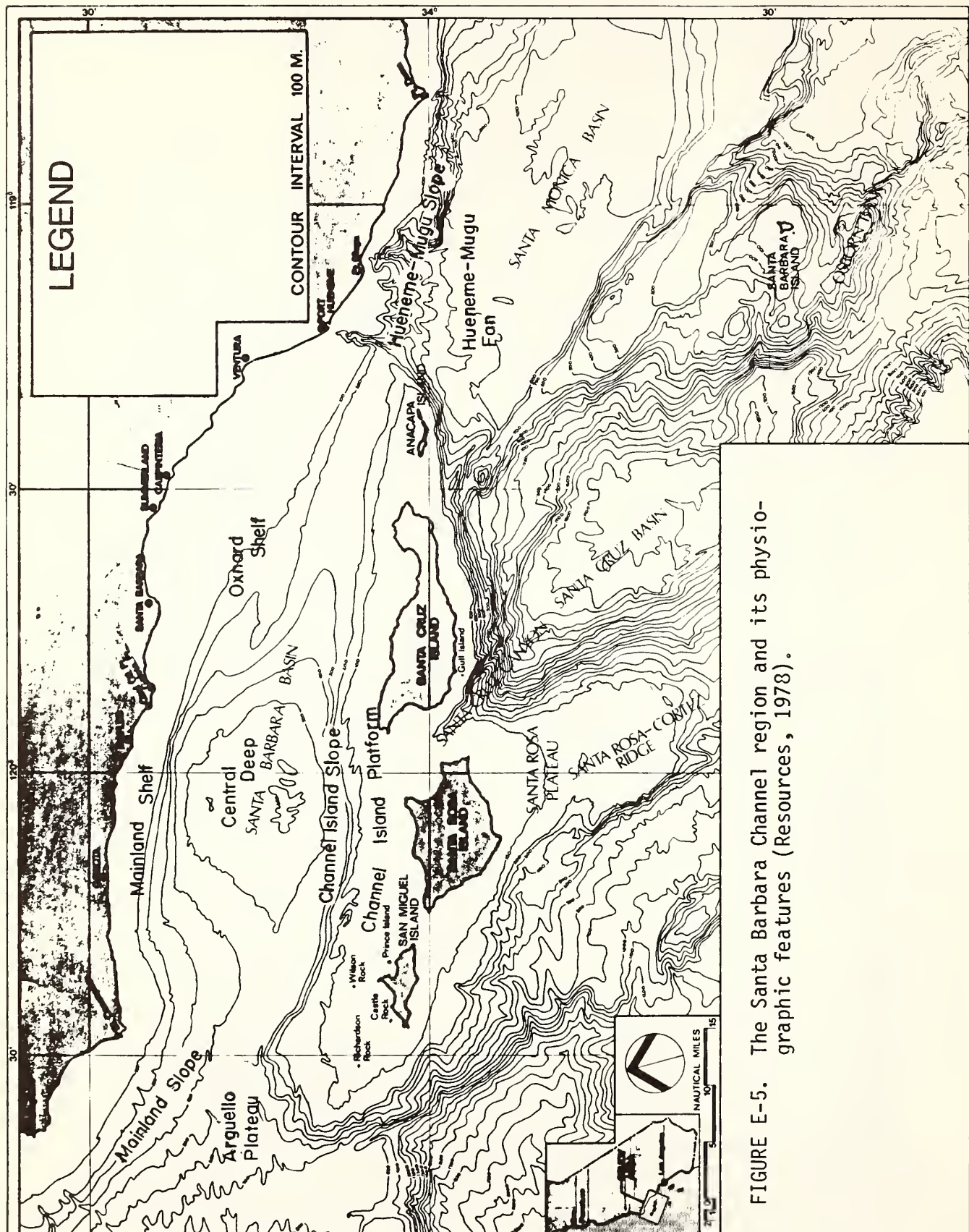


FIGURE E-5. The Santa Barbara Channel region and its physiographic features (Resources, 1978).

Two crucial pathways, which are addressed more fully in Section E.2 below, are the migratory movements of species to and from the northern Channel Islands area and biologic food chains. In both instances, the movement of living organisms and nutrients indicates the importance of dynamic marine processes and conditions in the immediate sanctuary area, the southern California region in general, and, for whales migrating from the Arctic, in areas as far away as the Beaufort Sea.

Although the influence of geographically wide-ranging factors is clearly significant, it does not diminish the exceptional importance of the localized marine habitat and resources of the waters surrounding the northern Channel Islands and Santa Barbara Island. Their location (1) at the confluence of two major biogeographic provinces; (2) in an area of upwelling and thus exceptionally high productivity; and (3) on a submarine ridge possessing a wide variation of open water marine habitat, provides the waters surrounding these islands with one of the biologically richest and most diverse marine environments in the United States.

E.2 Natural Resources of Exceptional Value

E.2.a Marine Mammals

More than 30 species of marine mammals have been sighted in the Southern California Bight including 27 species of whales and dolphins (cetaceans); 6 species of seals and sea lions (pinnipeds); and the sea otter (a member of the weasel family) (See Table E-1). While several species of whales and dolphins are common and important transient inhabitants of the waters surrounding the Channel

TABLE E-1. Marine mammals of the Southern California Bight (Point Conception-Mexican Border). Daugherty, 1965; University of California, Santa Cruz, 1976; Resources, 1978.

Common Name	Genus/Species	Estimated Population 1976*
<u>Pinnipeds</u>		
California sea lion	(<u>Zalophus californianus</u>)	40,000
Steller sea lion	(<u>Eumetopias jubatus</u>)	5-20
Northern fur seal	(<u>Callorhinus ursinus</u>)	1,200
Guadalupe fur seal	(<u>Arctocephalus townsendi</u>)	1-5
Northern elephant seal	(<u>Mirounga angustirostris</u>)	16,600
Harbor seal	(<u>Phoca vitulina</u>)	1,400
<u>Fissipeds</u>		
Sea otter	(<u>Enhydra lutris</u>)	1-5
<u>Cetaceans</u>		
Bryde's whale	(<u>Balaenoptera endeni</u>)	-
Minke whale	(<u>Balaenoptera acutorostrata</u>)	60
Blue whale	(<u>Balaenoptera musculus</u>)	7
Sei whale	(<u>Balaenoptera borealis</u>)	-
Finback whale	(<u>Balaenoptera physalus</u>)	23
Humpback whale	(<u>Megaptera novaeangliae</u>)	6
Gray whale	(<u>Eschrichtius robustus</u>)	336
Common dolphin	(<u>Delphinus delphis</u>)	33,564
Pacific pilot whale	(<u>Globicephala macrorhynoa</u>)	4,333
Risso's porpoise	(<u>Grampus griseus</u>)	556
White-sided dolphin	(<u>Lagenorhynchus obliquidens</u>)	10,007
Northern right whale dolphin	(<u>Lissodelphis borealis</u>)	1,848
Killer whale	(<u>Orcinus orca</u>)	122
Harbor porpoise	(<u>Phocena phocoena</u>)	0
Dall porpoise	(<u>Phocoenoides dalli</u>)	647
False killer whale	(<u>Pseudorca crassidens</u>)	0
Long-beaked dolphin	(<u>Stenella coeruleoalba</u>)	0
Pacific bottlenose dolphin	(<u>Tursiops gilli</u>)	557
Sperm whale	(<u>Physeter catodon</u>)	0
Pygmy sperm whale	(<u>Kogia breviceps</u>)	0
Baird's beaked whale	(<u>Berardius bairdii</u>)	-
Ginko-toothed whale	(<u>Mesoplodon ginkgodens</u>)	-
Cuvier's beaked whale	(<u>Ziphius cavirostris</u>)	0
Pacific right whale	(<u>Balaena glacialis</u>)	0
Pacific spotted dolphin	(<u>Stenella graffmani</u>)	0
Rough-toothed dolphin	(<u>Steno bredanensis</u>)	0
Hubb's beaked whale	(<u>Mesoplodon carlhubbsi</u>)	0
TOTAL SIGHTED		52,066

*Numbers for cetaceans indicate sighting from air and ship during 1975-76 study, not populations.

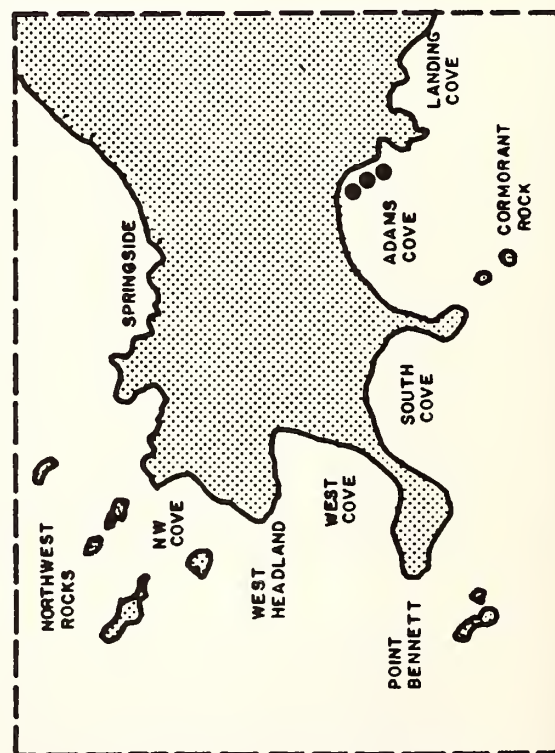
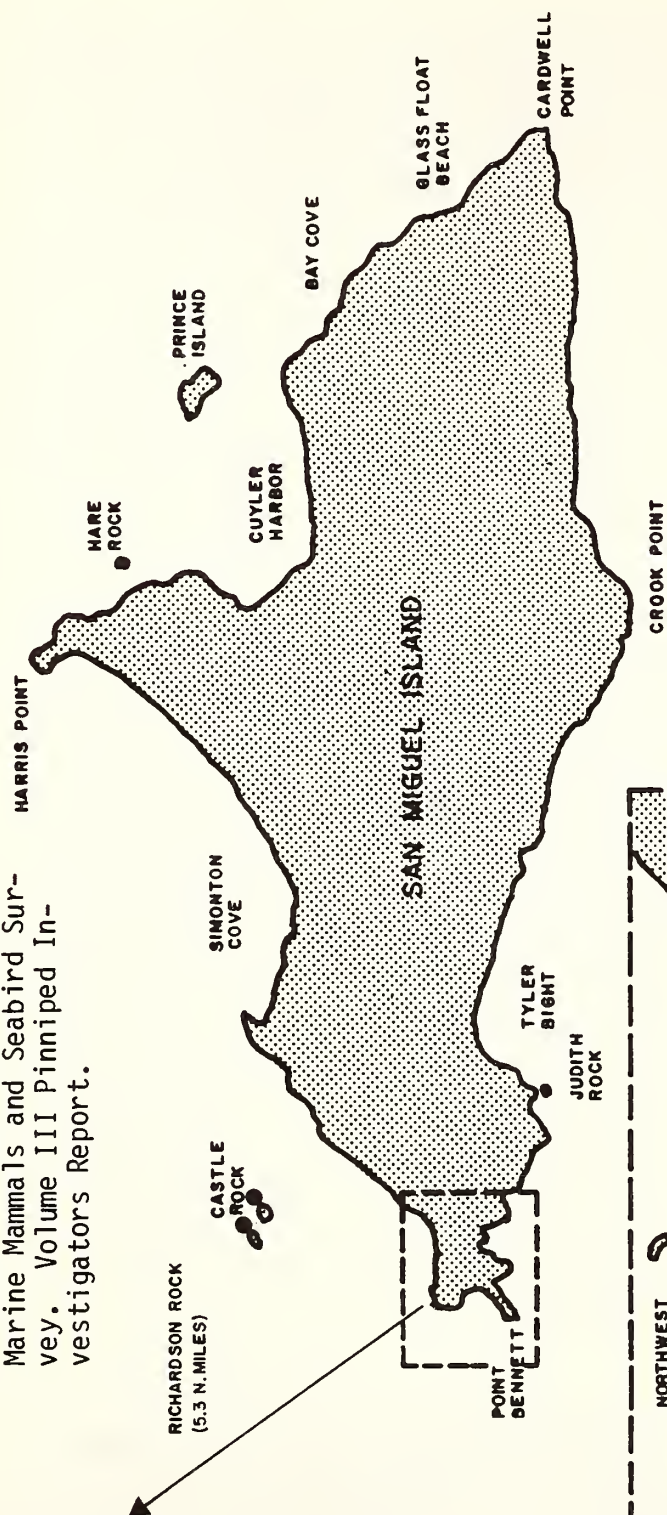
Islands, the area is especially significant for seals and sea lions which require the island shelves and shoreline habitat for haulout and feeding purposes. The national significance of the area is illustrated by the fact that San Miguel Island, particularly the west end around Point Bennett, is the only location in the U.S. and one of the very few places in the world where breeding populations of 5 species of pinnipeds can be found virtually side by side, with transient individuals of a sixth, the Guadalupe fur seal, also being occasionally sighted. The islands and surrounding waters are made even more important since the southern California mainland coast does not have major rookeries.

The pinnipeds, along with cetaceans, seabirds, and humans, represent one of the top carnivore groups in the Southern California Bight (University of California, Santa Cruz, 1976). Approximately 75,000 seals and sea lions have been estimated to live in the Bight where they consume some 185,625 metric tons (168,750,000 kg) of food annually (University of California, Santa Cruz, 1976). This makes pinnipeds a major link in the Bight's food chain and ecological balance. Although information on the role of pinnipeds in the ecology of the Bight is limited, their large food requirements indicate that they could provide important functions with regard to maintaining species abundance levels through the food chain. The unusually large population levels of pinnipeds (as well as whales, dolphins, and seabirds) is indicative of the region's high productivity rate which can be traced back to the aforementioned upwelling phenomenon.

In general, the two most important pinniped concentration areas in the Bight are on the western tip of San Miguel Island around Point Bennett (see Figures E-6a-d) and on the southwestern side of San Nicolas Island (University of California, Santa Cruz, 1976). As

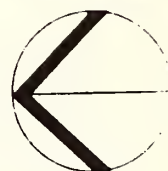
FIGURE E-6a. Location of major breeding and haul out sites of four pinniped species on San Miguel Island. Source: Draft Final Report 1975-1978. Marine Mammals and Seabird Survey. Volume III Pinniped Investigators Report.

Northern fur seal
(*Callorhinus ursinus*)



LEGEND

- Areas where at least 20 animals have been sighted (the number of ●'s is not indicative of the number of animals sighted)



California sea lion
(*Zalophus californianus*)

FIGURE E-6b. Location of major breeding and haul out sites of four pinniped species on San Miguel Island.
Source: Draft Final Report 1975-1978. Marine Mammals and Seabird Survey. Volume III Pinniped Investigators Report.

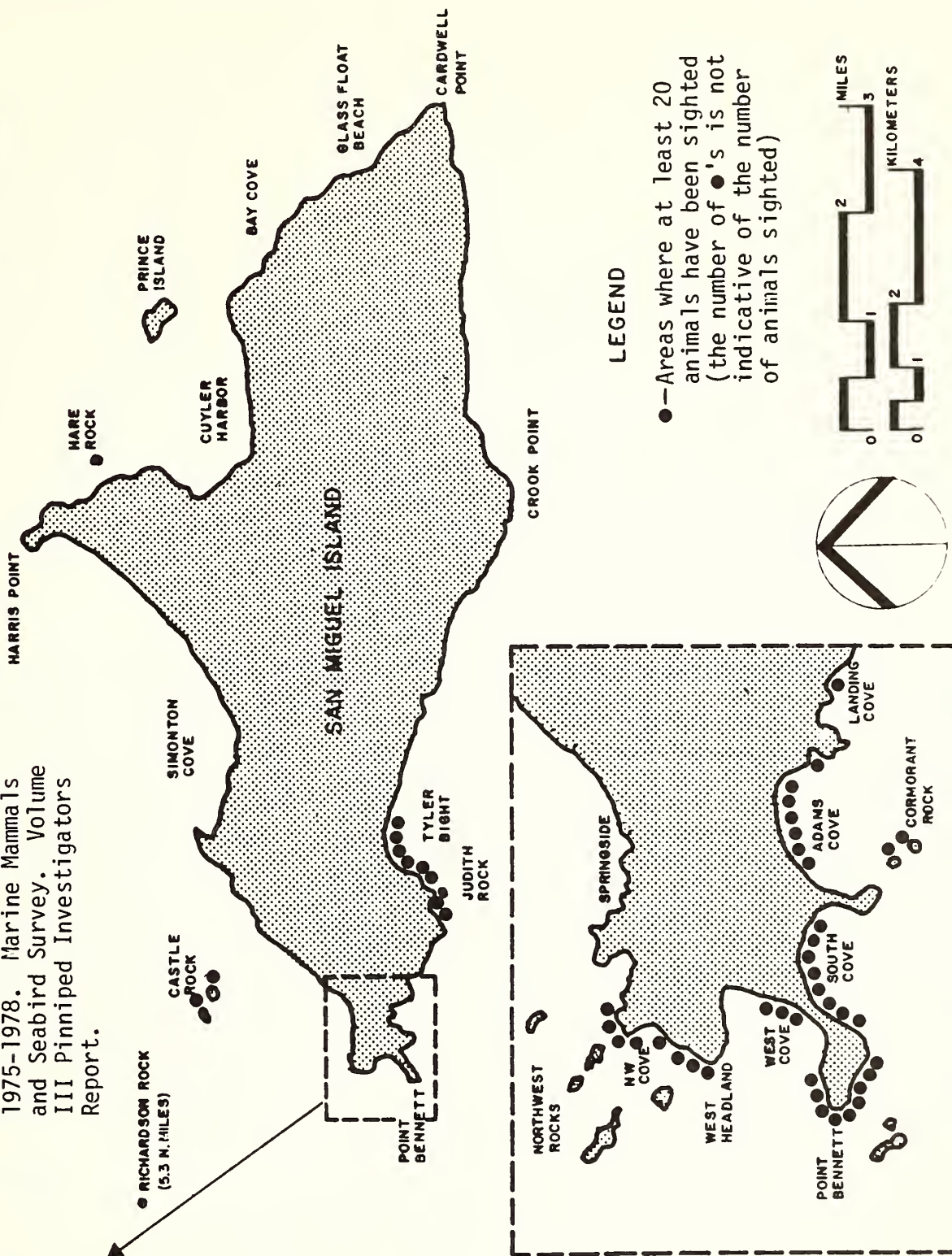
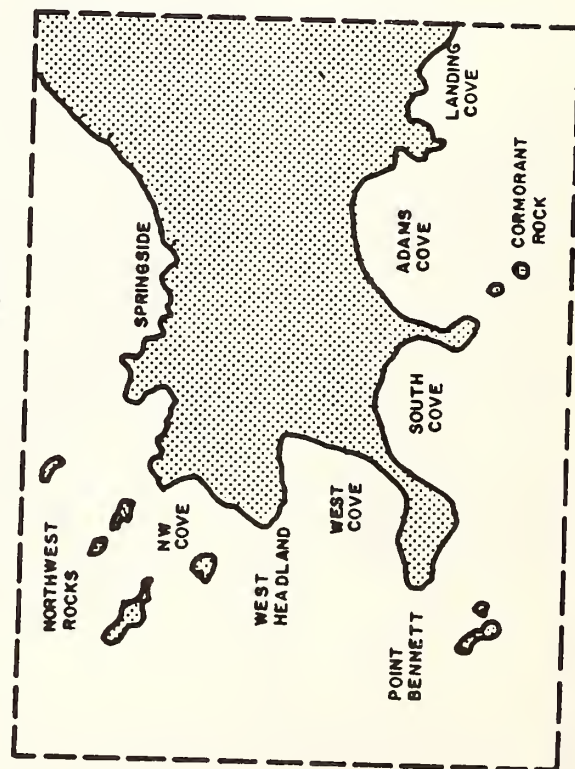
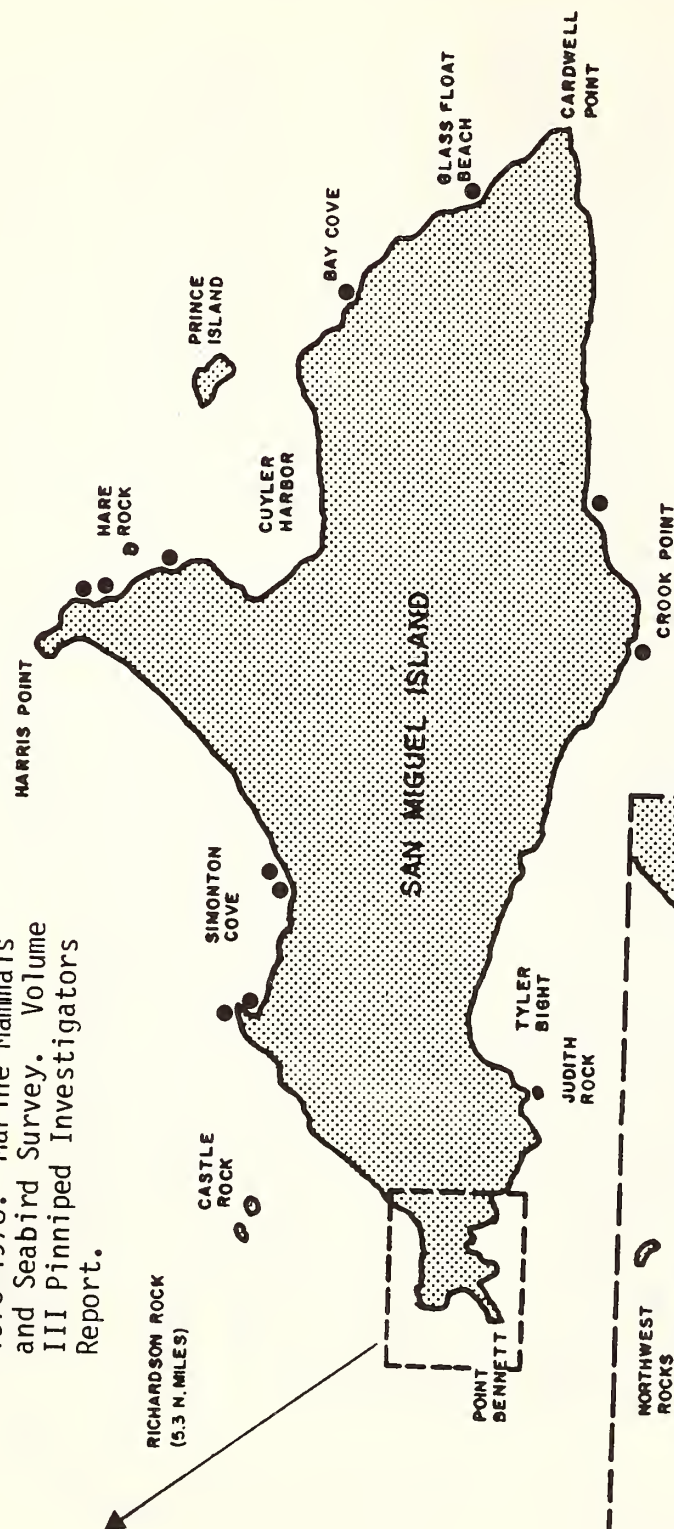


FIGURE E-6c.

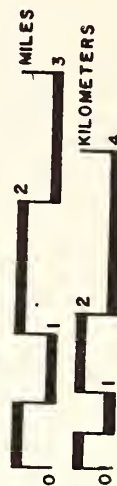
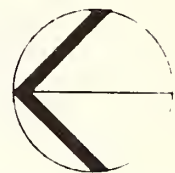
Location of major breeding and haul out sites of four pinniped species on San Miguel Island.
Source: Draft Final Report 1975-1978. Marine Mammals and Seabird Survey. Volume III Pinniped Investigators Report.

Harbor seal
(*Phoca vitulina*)



LEGEND

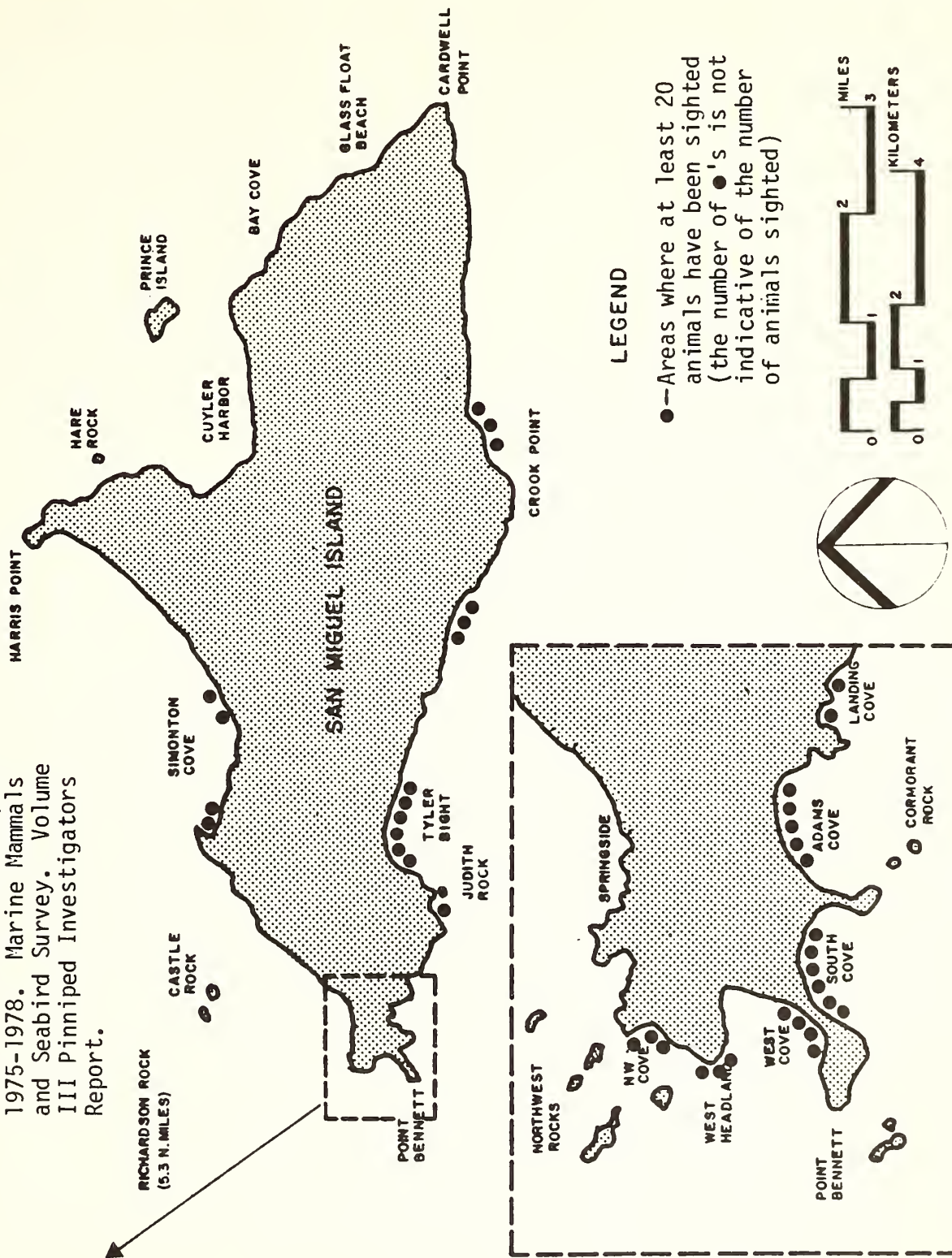
- Areas where at least 20 animals have been sighted (the number of •'s is not indicative of the number of animals sighted)



Northern elephant seal
(*Mirounga angustirostris*)

Location of major breeding and haul out sites of four pinniped species on San Miguel Island.
Source: Draft Final Report 1975-1978. Marine Mammals and Seabird Survey. Volume III Pinniped Investigators Report.

FIGURE E-6d.



shown on Table E-2 however, Santa Rosa, Santa Cruz, Anacapa, and Santa Barbara Islands also pinniped haulout and rookery areas. Some of the more significant ecological information on pinnipeds is summarized in Table E-3. This information indicates that the island shelf waters probably provide important feeding areas for the pinnipeds in the area. Surrounding island waters also provide 1) island-bred pups with their first aquatic habitat and feeding areas; 2) a source of refuge for hauled-out animals startled by aircraft, nearshore boats, or land-based disturbance; and 3) a buffer area against the impacts of ocean development and use occurring greater distances from shore. Table E-4 shows the seasons for different pinniped activities.

Although none of the six pinniped species are currently listed as endangered or threatened under provisions of the Endangered Species Act of 1973, the National Marine Fisheries Service has expressed an intent to consider the Guadalupe fur seal for listing as an endangered species (Loughlin, 1979, personal communication). Also, two species of pinnipeds, the Guadalupe fur seal and northern elephant seal, are listed in the "Convention on International Trade in Endangered Species of Wild Flora and Fauna" and in the International Union for Conservation of Nature's (IUCN) "Red Book" list of endangered and threatened wildlife. The Guadalupe fur seal is shy, secretive, and rare; San Miguel Island is one of the few areas in Southern California where it has been sighted in recent years.

As mentioned above, whales and dolphins tend to be more transient inhabitants of surrounding island waters. Because cetaceans cannot haul out on island shores, they tend to be less dependent than pinnipeds on habitats adjacent to the islands. Although present information is inconclusive, available data has led some

TABLE E-2. Pinniped rookery and haul out areas of the study area (University of California, Santa Cruz, 1976; Resources, 1978).

Nameplace	Species Present	Activity
Richardson Rock (San Miguel Is.)	California sea lion Northern fur seal	Breeding-pupping * Breeding-pupping
Castle Rock (San Miguel Is.)	California sea lion Northern fur seal Steller sea lion	Breeding-pupping Breeding-pupping Breeding-pupping
Point Bennett Rock (San Miguel Is.)	Guadalupe fur seal	Haulout only
Point Bennet-Adams Cove (San Miguel Is.)	Northern fur seal California sea lion Northern elephant seal Steller sea lion	Breeding-pupping Breeding-pupping Breeding-pupping Breeding-pupping
Simonton Cove (San Miguel Is.)	Harbor seal Northern elephant seal	Breeding-pupping Breeding-pupping
Cuyler Harbor Area (San Miguel Is.)	Harbor seal	Breeding-pupping
Sandy Point-Blockhouse Beach (Santa Rosa Is.)	Harbor seal	Breeding-pupping
Beechers Bay (Santa Rosa Is.)	California sea lion	Breeding-pupping *
Fraser Point (Santa Cruz Is.)	California sea lion	Breeding-pupping *
Arch Rock East (Sant Cruz Is.)	Harbor seal	Breeding-pupping
Scorpion Anchorage (Santa Cruz Is.)	Harbor seal	Breeding-pupping
Kinton Point South/Morse Point (Santa Cruz Is.)	Harbor seal	Breeding-pupping
Gull Island (Santa Cruz Is.)	California sea lion Harbor seal	Breeding-pupping * Breeding-pupping
Anacapa Island	California sea lion Harbor seal	Breeding-pupping * Breeding-pupping
Santa Barbara Island	California sea lion Northern elephant seal Harbor seal	Breeding-pupping Breeding-pupping Breeding-pupping

*The use of these areas as rookeries by California sea lions is only speculative; however, all are definitely used as haul out areas.

TABLE E-3. Summary of ecological information for seals, sea lions, and sea otters found in waters around San Miguel, Santa Rosa, Santa Cruz, Anacapa, and Santa Barbara Islands. (National Marine Fisheries Service, 1978; Woodhouse et al., 1977; Daugherty, 1965; University of California, Santa Cruz, 1976.)

California sea lion
(Zalophus californianus)

Most abundant pinniped in Southern California Bight; range from British Columbia into Mexico; northernmost established rookery on San Miguel Island; breed in June and July and disperse in Fall and Winter; adult males migrate north after breeding season while female and pups move southward into Mexican waters; major sites of activity in Southern California Bight on San Miguel, San Nicolas, Santa Barbara, and San Clemente Islands; generally opportunistic feeders preferring squid, hake, anchovy, other small fish, and mollusks; feed in waters relatively near hauling grounds over island shelves.

Northern elephant seal
(Mirounga angustirostris)

Largest and second most abundant pinniped in Southern California Bight; range from Alaska to Mexico; numbers increasing; breeding season from December through March with breeding range from Point Reyes to Baja California; 9 breeding colonies including one on San Miguel (the second largest) and one on Santa Barbara; spend most of the year in the water but haulout once to breed in Winter and once to molt in Spring; feed both near shore and in deep water on squid, hake, sharks, skates, rays and ratfish.

Northern fur seal
(Callorhinus ursinus)

Range from the Bering Sea to Mexico; abundant in the northern part of their range but scarce to the south; small breeding population on San Miguel represents the southern breeding limit; San Miguel population increasing; breeding season begins in early Summer; pups tended on shore through early Fall; from Fall to Spring maintain an oceanic existence rarely touching land; during Winter found over the Santa Rosa Ridge and San Nicolas Basin near Tanner Banks and beyond the continental shelf; feed on anchovy, saury, hake, squid, and other small fish; particularly susceptible to oil pollution.

TABLE E-3 Cont.

Harbor seal
(Phoca vitulina)

Eastern Pacific range from Bering Sea to Mexico; also in western Pacific and Atlantic; breeding season from April to early July; pups usually born on land but may be born in water; pups nursed 4 to 6 weeks; pups have been observed on San Miguel, Santa Rosa, Santa Cruz, Santa Barbara, San Nicolas and Santa Catalina; adults probably remain in Southern California Bight area after breeding; greatest Bight population density around northern Channel Islands and in the Santa Barbara Channel near Santa Rosa Island; feed principally on fish, crustaceans, and mollusks; apparently prefer relatively shallow warmer coastal waters; extremely shy and secretive.

Northern(Steller) sea lion
(Eumetopias jubatus)

Range from Bering Sea to California Channel Islands in the eastern Pacific, also in western Pacific; abundant in Alaskan waters but rare in South California; numbers have decreased precipitously for unknown reasons (possibly due to temperature fluctuations) since 1930's in Channel Island area while increasing in Alaska; breeding season from late May to early July; feed on clams, rockfish, squid, octopus, flounder, and other fish and crustaceans; indications that feeding may be near land and in shallow (less than 600 ft. or 182m) water.

Guadalupe fur seal
(Arctocephalus townsendi)

Range from northern Channel Islands to Mexico; once abundant, hunting reduced numbers to near extinction in early 1900's; now one of rarest pinnipeds in Southern California; numbers appear to be increasing; breeding season from May to July or August; most sightings of this species in the Southern California Bight have been made on San Miguel in May.

Sea otter
(Enhydra lutris)

Range from Alaska to Southern California; few individuals believed to be transients sighted off Anacapa and San Miguel; California population almost decimated by hunting in 18th and 19th centuries but populations now expanding from central California; not migratory although long distance wandering by young males reported; in California it is believed (not well documented) pups are born in water; rarely haulout of water; feed primarily on benthic mollusks, crabs and sea urchins but occasionally take fish; diving for food limited to about 120 ft. (36m) thus habitat is primarily limited to areas within 120 ft. (36m) depths; prefer rocky bottom and kelp habitat but also found in sandy bottom areas.

Table E-4: Approximate times of pinniped activity in the study area.
(U. S. Geological Survey, 1976.)

Species	On Land	Pupping	Breeding	Nursing
Northern fur seal	May to about 15 November	Late May to mid-August	Late May to late August	Late May to about 15 November
Northern sea lion	May through November ^a	June	June	June to November. A few may nurse all year
California sea lion	All year	June	June to July	June to November. A few all year
Northern elephant seal	All year except when feeding	Late December to late February	January to mid-March	Late December to mid-March
Harbor seal	All year	March April	April May	March to May
Guadalupe fur seal	A few all year			

^aA few may be on land at any time.

marine mammal experts to think that dolphins might cluster over submerged areas of high topographic relief such as ridges, banks, plateaus, or island/mainland shelves (Evans, 1975). At least one team of marine scientists has suggested the hypothesis that the biota of the entire Southern California Bight ecosystem (including pinnipeds, cetaceans, seabirds, benthic organisms and others) might tend to concentrate over such high relief areas rather than the relatively flat and deeper plains and basin areas (University of California, Santa Cruz, 1976).

At least 27 species of cetaceans have been seen in the waters of the study area. These waters may function as the home range of the common dolphin, Pacific white-sided dolphin, and the Pacific bottlenose dolphin. Pilot whales also use the area as a feeding ground; large concentrations of pilot whales have been sighted feeding on squid (Patterson, 1979, personal communication). The Pacific right whale, one of the rarest of the great whales, has occasionally been viewed in the Channel Islands area. The study site may be of considerable importance to the right whale both as habitat and foraging area but further research appears necessary to substantiate this assertion (Patterson, 1979, personal communication).

Migrating gray whales pass through the area twice each winter with estimated populations ranging as high as 10,000 to 12,000 (Patterson, 1979, personal communication). Furthermore, observations of gray whales with calves close to the islands indicate that the study site is one of the prime focuses of returning calf migrations. Scientists have also observed cows and calves "hanging out" in the kelp beds (Patterson, 1979, personal communication). One possible explanation for this behavior may be that nearshore kelp beds offer protection from strong seas and provide a resting

spot for calves (Leatherwood, 1979, personal communication).

The area is also important for several endangered species, including the blue, fin, and humpback whale. Both blue and fin whales have been observed over long periods of time in waters just seaward of the study area (Patterson, 1979, personal communication). Local fishermen have reported sighting "stationary" blue whales during the early summer, which suggests that whales feed nearby (Patterson, 1979, personal communication).

Table E-5 lists 10 of the more common cetaceans observed in the study area, details information on historical sightings, and provides brief ecological notes.

In general, the large size, high mobility, and wide pelagic range of these whales have discouraged compilation of more complete ecological species accounts. It is clear, however, that toothed whales and dolphins, like most pinnipeds, represent a major link in the overall food chain within the study area and, due to their apparent attraction to high relief areas, frequent island shelves. Furthermore, it is probable that cetaceans play a significant role in influencing relative species abundance levels of other marine biota.

Another marine mammal in the waters around the northern Channel Islands is the sea otter. Currently, this species is known to the area only by occasional sightings of a few individuals (probably transient males) off the islands of San Miguel and Anacapa (Resources, 1978). As noted in Table E-3, the sea otter rarely hauls out, is limited to shallow (less than about 120 ft (37m)) coastal waters, and is a voracious feeder on mollusks and shellfish.

TABLE E-5. Historical species accounts and ecological information for cetaceans sighted over or adjacent to island shelves off San Miguel, Santa Rosa, Santa Cruz, Anacapa, and Santa Barbara. (Daugherty, 1965; National Marine Fisheries Service, 1978.)

Species	Historical Sightings	Historical Sightings	Ecological Notes
	around the Northern Channel Islands and Santa Barbara Island	throughout the Southern California Bight and Beyond	
Gray whale (<u>Esochrichtius robustus</u>)	14 sightings between Jan. - Mar.; all around the northern Channel Islands; none sighted during rest of the year.	East Pacific population ranges from Beaufort Sea to Baja Mexico; abundant in Channel Islands between Jan. and Mar.; scattered sightings remainder of the year.	Species summers in the northern waters and migrates south along the coast to Baja California and the Gulf of California in winter; feeds on benthic amphipods and invertebrates during Summer; fasts during Winter; calves born in Winter; listed as "endangered"; numbers are increasing.
Fin whale (<u>Balenoptera physalus</u>)	1 sighting south of Santa Rosa in the Oct. - Dec. period.	Worldwide in distribution; found south to California in Summer; more southerly in Winter; scattered sightings in Bight. year round	Second largest whale; feeds on plankton (especially euphausiids) and occasionally fish; mating and calving season in Winter; calf weaned at about 7 months; listed as "endangered".
Humpback whale (<u>Megaptera novaeangliae</u>)	1 sighting off western Anacapa Island between Jan. - Mar.	Worldwide range except for polar pack ice zones; between 1949 and 1973, 20 recorded sightings in Bight.	Noted for sound producing capabilities; migrates extensively from high latitudes in Summer to continental and island coasts in low latitudes in Winter; a baleen whale; feeds on krill and also anchovies and sardines when available; calving season from Oct. to Mar.; listed as "endangered".
Killer Whale (<u>Orcinus orca</u>)	5 sightings off northern Channel Islands; all sightings between Jan. - Sept.	Worldwide range; 29 sightings in Bight throughout the year but mostly in cooler months.	Most common in highly productive coastal waters; known to lie off seal and sea lion rookeries during pupping season to feed on animals entering or leaving the water; usually found in groups of 10 to 100; also feed on squid, dolphins, flatfish, octopus and whales.

TABLE E-5 Cont.

Species	Historical Sightings around the Northern Channel Islands and Santa Barbara Island	Historical Sightings throughout the Southern California Bight and Beyond	Ecological Notes
Pilot whale (short finned) (<u>Globicephala macrohynchus</u>)	2 sightings off western Santa Cruz Island between Oct. and Dec.	Range through North Pacific and North Atlantic; fairly abundant around Cali- fornia Channel Islands year round but most common in Winter.	Travel in schools; feed on squid and schooling fish; appear to calve year round; prefers off- shore waters but moves closer to land in search of food.
Pacific white-sided dolphin (<u>Lagenorhynchus obliquidens</u>)	10 sightings over all seasons and off all islands.	Range north Pacific south to Baja Califor- nia; sighted frequent- ly throughout the year in the Bight.	Occurs in schools of usually less than 100 animals; prefers continental shelf and slope areas; breeds in Spring and Autumn; feeds on squid, octopus and small schooling fish; concentrates in numbers in San Miguel area in Summer months.
Dall's porpoise (<u>Phocoenoides dallii</u>)	15 sightings throughout the year and off all islands; most common between Jan. - Mar.	Range east and west north Pacific; frequent sightings throughout the year; most abun- dant in all and inter.	Usually found in groups of 2 to 20; feed on squid and small schooling fish at both mid-water and deep-water depths.
Common dolphin (<u>Delphinus delphis</u>)	9 sightings throughout the year and off all islands.	Range worldwide in temperate and tropical waters; probably most common cetacean in Bight.	Congregate in schools of a few to several thousand; feed on anchovy, squid, hake, mackerel, sardine, sea bass, and lantern fish; rarely found in waters less than 182m (600 ft.) but frequents deeper ridges and sea mounts; 2 mating seasons Jan.-April and Aug.-Nov. and 2 calving seasons Mar.-May and Aug. - Sept.
Northern right whale dolphin (<u>Lissodelphis borealis</u>)	1 sighting off south- east Santa Rosa between Oct.-Dec.; 1 sighting south off Santa Cruz between July-Sept.	Range temperate north Pacific; scattered sightings throughout Bight, mostly between Oct.-Mar.	Travels in schools of 100 to over 1,000; found in open ocean but observed most commonly along continental slope, near ridges and submerged plateaus, and close to islands and mainland; feed on squid, lantern fish, and miscellaneous fish.
Bairds beaked whale (<u>Berardius bairdii</u>)	6 animals observed in 1970 south of Santa Cruz Island.	Range north Pacific from Alaska to Southern California, only 1 other sighting in Bight area over Tanner Banks.	Usually travel in tight schools of up to 30 animals; feed on deep-water fish and squid; migrations poorly known; rare as far south as Southern California.

Because of its consumption of sea urchins, abalone, and other shellfish, the sea otter is an important factor in determining the abundance of other marine species and possibly even the type of habitat (Woodhouse et al., 1977; Yellin, 1977). At least some scientists have suggested that the otter's consumption of sea urchins, which graze on the attachment points of kelp, may indirectly lead to an expansion of kelp beds (Yellin, 1977). (Kelp beds, as discussed in Section E.2.c., provide a special habitat for many organisms in much the same manner as coral reefs.)

Ranging throughout the Southern California Bight and beyond, the marine mammals in the waters around the islands affect the food chain and natural ecosystem stability in a broad region. Mainland-based coastal pollution and intensive littoral development have (both directly and indirectly) reduced certain mainland haulout areas for seals and sea lions here. Therefore, the remaining populations on shorelines and in adjacent waters provide an important indicator of broad environmental health and conditions as well as an extremely valuable vestige of marine wilderness and species distribution. Seals, sea lions, and possibly whales and porpoise also provide an invaluable research and public educational potential.

Finally, marine mammals, particularly the migratory gray whale (see Figure E-7), support recreational benefits of considerable economic importance. As these whales travel along the shore, charter boats carry paying customers in increasing numbers out for closer observation. In some cases, whale watchers even charter planes.

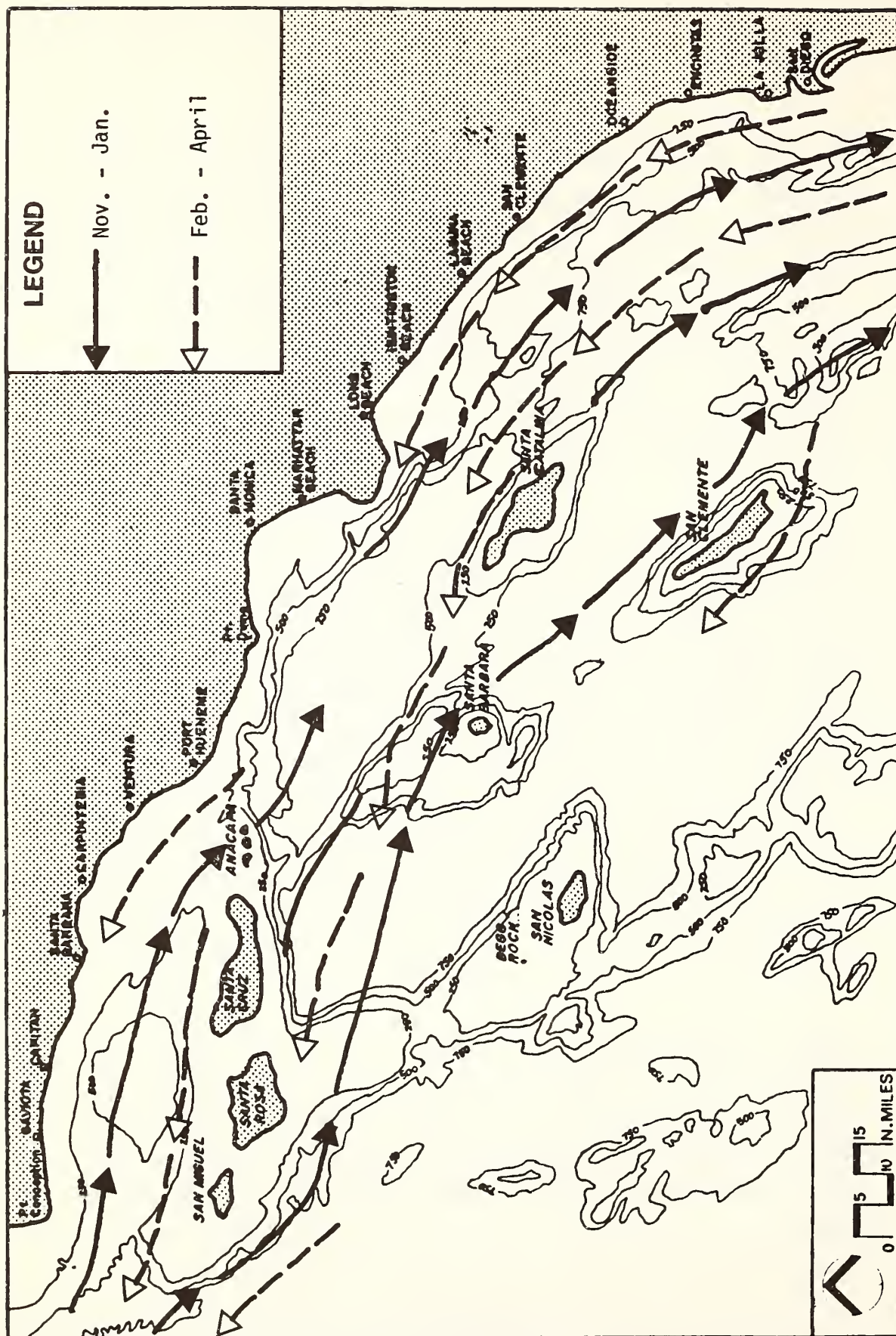


FIGURE E-7. Migration routes of the gray whale (Modified from Resources, 1978).

E.2.b. Marine Birds

The northern Channel Islands and Santa Barbara Island are a focal point for one of the richest resource areas for marine birds in the United States. This richness is based on both numbers and species diversity. Seabird concentrations occur not only on the islands themselves (which provide nesting habitat for more than 60 of southern California's breeding seabirds) but also on the productive waters around the islands over which many species forage for food. A recent study of Southern California Bight marine avifauna (University of California, Santa Cruz, 1976) collected baseline data on 64 species of seabirds including nesting species, year-round visitors, summer visitors, winter visitors, transients, and strays (see Table E-6). Because of their highly mobile and migratory habits, probably all of these seabird species appear at least occasionally around the northern Channel Islands and Santa Barbara Island.

The brown pelican is the only breeding seabird species found on the Channel Islands which is listed as endangered due to low population levels. Among the other endangered terrestrial species found on the Islands are the light-footed clapper rail, Belding's savannah sparrow, the peregrine falcon, and the southern bald eagle.

Of greatest significance to the proposed sanctuary are the large number of marine bird species which use the relatively shallow marine waters around these islands (see Table E-7). For example, seabirds nesting on the northern Channel Islands tend to forage near their rookeries and close to island shores. Limited tracking

TABLE E-6. The marine avifauna of the Southern California Bight (developed from University of California, Santa Cruz, 1976).

1. Nesting Species

Ashy storm-petrel (on Channel Islands)	Pigeon guillemot (on Channel Islands)
Brown pelican (on Channel Islands)	Xantus' murrelet (on Channel Islands)
Double-crested cormorant (on Channel Islands)	Cassin's auklet (on Channel Islands)
Brandt's cormorant (on Channel Islands)	Least terns (on mainland only)
Pelagic cormorant (on Channel Islands)	Caspian terns (on mainland only)
Western gull (on Channel Islands)	Elegant terns (on mainland only)

2. Year-round Visitors (do not breed on the Islands but can be expected any time of the year)

California gull	Forster's tern	Royal tern
Ring-billed gull	Black storm-petrel	Black-footed albatross

3. Summer Visitors

Least storm-petrel	Craveri's murrelet	Pink-footed shearwater
Red-billed tropicbird	Leach's storm petrel	Sooty shearwater

4. Winter Visitors

Heermann's gull	Short-tailed shearwater	Glaucous-winged gull
Northern fulmar	Manx shearwater	Herring gull
Common loon	Fork-tailed storm petrel	Common murre
Arctic loon	White-winged scoter	Thayer's gull
Red-throated loon	Surf scoter	Mew gull
Horned grebe	Red-breasted merganser	Bonaparte's gull
Eared grebe	Red phalarope	Black-legged kittiwake
Western grebe	Pomarine jaeger	Rhinoceros auklet

5. Transients (pass through Southern California waters while migrating)

New Zealand shearwater	Skuas
Brant	Sabine's gull
Parasitic jaeger	Common tern
Long-tailed jaeger	Horned puffins

6. Strays (occur in small numbers but not considered part of Bight's avifauna)

Red-necked grebe	Laysan albatross
Ancient murrelet	Cape petrel

TABLE E-7. Marine birds of the Southern California Bight sighted or reported near the northern Channel Islands and Santa Barbara Island (adapted from University of California, Santa Cruz, 1976).

Species	
Common loon (<u><i>Cavia immer</i></u>)	Present Oct. - May; remain inshore near to island and mainland coasts; migrate north during summer.
Arctic loon (<u><i>Cavia arctica</i></u>)	Present Oct. - June; some may remain during Summer; in Nov. 1975 they were observed throughout the Bight but in Jan. they had concentrated in protected inshore waters around northern Channel Islands; most abundant loon in Bight.
Red-throated loon (<u><i>Cavia stellata</i></u>)	Present Oct. - April; numerically dominant loon inshore along mainland coast but with some nearshore island records; virtually absent offshore.
Horned grebe (<u><i>Podiceps auritus</i></u>)	Present Nov. - April; usually along mainland coast also present in small numbers around northern Channel Islands.
Eared grebe (<u><i>Podiceps nigricollis</i></u>)	Present Sept. - June; move to inland nesting sites in late inter; concentrate around northern Channel Islands in mid-Feb.; out number other Grebes in Channel area and constitute a significant portion of nearshore avifauna.
Northern fulmar (<u><i>Fulmarus glacialis</i></u>)	Present Nov. - June; appear to concentrate over Santa Barbara Channel, northern islands chain, northern Patton Escarpment, Tanner, Cortes and Fortymile Banks, and Coronado Escarpment.
Pink-footed shearwater (<u><i>Puffinus creatopus</i></u>)	Present year round but most abundant June to Sept.; second most abundant Shearwater; most frequent around northern Channel Islands, along Santa Rosa-Cortes Ridge, in Santa Barbara Channel, in San Nicolas Basin and east of longitude 118° along U.S.-Mexican border.
New Zealand shearwater (<u><i>Puffinus bulleri</i></u>)	Transient species seen rarely Sept. - Nov.; sightings seen in 1975-76 survey, 4 to 7 individuals were seen in Sept. near San Miguel Island; also seen in May.
Sooty shearwater (<u><i>Puffinus griseus</i></u>)	Most abundant Bight shearwater; summer visitor, greatest concentrations around northern Channel Islands, and over northern Santa Rosa-Cortes Ridge; may concentrate north and west of Santa Rosa and San Miguel Islands in Sept. before beginning southward migration; Summer and Spring feeding appears to be just west of San Miguel Island; remain closer to shore during upwelling season.
Fork-tailed storm petrel (<u><i>Oceanodroma furcata</i></u>)	Identified as a Winter visitor but sighted only on four occasions during 1975-76 survey; one sighting was directly over Osborn Bank near Santa Barbara Island in Nov.
Leach's storm petrel (<u><i>Oceanodroma leucorhoa</i></u>)	Summer visitor with peak numbers in July; generally more than 16 mi (30km) offshore over shallower banks; also most numerous storm petrels in San Miguel Island and Cortez Bank areas; prefer upwelling areas.

TABLE E-7 Cont.

<u>Species</u>	
<u>Glaucous-winged gull</u> (<u>Larus glaucescens</u>)	Present Oct. - May, appears to concentrate over San Miguel and Santa Rosa Island but also San Nicolas, Santa Cruz, and Santa Barbara, occasionally wander offshore; scavenge around pinniped hauling grounds.
<u>Western gull</u> (<u>Larus occidentalis</u>)	Present throughout year; in Spring and early Summer greatest numbers around breeding colonies on San Miguel, Anacapa, San Nicolas and Santa Barbara Islands and 5.4 to 16.2 nmi (10 to 30km) offshore of these areas; move to southeast in late summer and early inter.
<u>Herring gull</u> (<u>Larus argentatus</u>)	Present Nov. - April; mostly from Jan. - Mar.; scattered along mainland and northern Channel Islands in Jan. but more on islands in March.
<u>California gull</u> (<u>Larus californicus</u>)	Year round; numbers peak on mainland and offshore at Santa Rosa and Santa Catalina Islands in January.
<u>Mew gull</u> (<u>Larus canus</u>)	Present Nov. - April; found along mainland beaches, at sea, and near the shores of the northern Channel Islands in Jan.
<u>Heermann's gull</u> (<u>Larus heermanni</u>)	Present June - Mar.; found infrequently in offshore waters, rather often on beaches of the Channel Islands, and commonly on mainland beaches.
<u>Black-legged kittiwake</u> (<u>Rissa tridactyla</u>)	Present Nov. - May; local concentrations northwest of San Miguel Island and southeast of Anacapa in Dec.; uncommon on beaches but abundant offshore in Jan.
<u>Common tern</u> (<u>Sterna hirundo</u>)	Near mainland coasts between April - June and Aug. - Nov.; one sighting reported near Santa Cruz Island.
<u>Royal tern</u> (<u>Thalasseus maximus</u>)	Present Aug. - Feb.; more numerous among Channel Islands than mainland beaches; two major concentration areas in flight, one of which is around northern Channel Islands.
<u>Pigeon guillemot</u> (<u>Cephus columba</u>)	Common during Spring and Summer near nesting sites on San Miguel, Santa Rosa, Santa Cruz, Anacapa, and Santa Barbara Islands; rarely more than 2.2 nmi (4km) from shore; present from March - July.
<u>Xantus' murrelet</u> (<u>Urimya chura hypoleuca</u>)	Present in moderate to high densities near breeding colonies on Santa Barbara during Spring; common northwest of Santa Barbara Island in Jan. - Feb.
<u>Cassin's auklet</u> (<u>Ptychorampus aleuticus</u>)	Present throughout flight; inter concentrations near San Miguel Island, Anacapa Passage, along Santa Rosa-Cortes Ridge, and near San Diego; summer concentrations near large breeding colonies on San Miguel Island.
<u>Horned puffin</u> (<u>Pratercula corniculata</u>)	Present May - June; possibly increasing numbers; seen during 1975 survey in small numbers west of Santa Barbara Island.
<u>Mottled puffin</u> (<u>Lunda cirrhata</u>)	Sighted rarely but most frequent in the vicinity of Santa Cruz Basin and offshore of San Miguel Island during January.

TABLE E-7 Cont.

<u>Species</u>	
Ashy storm petrel (<u>Oceanodroma homochroa</u>)	Appear to prefer offshore ridge areas; most common in northern Bight area, nests in northern Channel Islands.
Brown pelican (<u>Pelecanus occidentalis</u>)	Year round with peak abundance Sept. - Dec. due to influx of individuals from Mexico; nest on Anacapa Island; areas of greatest concentration northern and central Channel Islands.
Double crested cormorant (<u>Phalacrocorax auritus</u>)	Almost exclusively on the immediate Channel Island coastlines, particularly near known nesting colonies at San Miguel (Prince Island), Santa Barbara, and Anacapa Islands; greatest numbers in Sept. and winter months.
Frank's cormorant (<u>Phalacrocorax penicillatus</u>)	Most abundant onshore and in nearshore waters; nesting colonies among the four northern Channel Islands--particularly San Miguel Island; occasionally seen offshore but return to islands each day.
Relagic cormorant (<u>Phalacrocorax pelagicus</u>)	Probably year round, almost totally restricted to the waters immediately around the northern Channel Islands and Santa Barbara Island; rarely occurring offshore; breeding population on Channel Islands.
Brant (<u>Branta bernicla</u>)	Transient between Oct. - Nov. and Mar. - April; present in large numbers in April during northward migration.
White-winged scoter (<u>Melanitta deglandi</u>)	Present Sept. - April; distributed throughout Bight with peak concentrations around northern Channel Islands in Jan. - Feb.
Surf scoter (<u>Melanitta perspicillata</u>)	Present Oct. - June; present in inshore waters of mainland coast and northern Channel Islands; gradually decrease numbers from April - June; widely reported offshore (more than 2.7 nmi or 5km) around certain islands in Nov.; concentrate near Santa Rosa Island in March.
Red-breasted merganser (<u>Mergus serrator</u>)	Present Sept. - May; in fall concentrate along mainland coast and coast of Santa Cruz Island; by Feb. cluster inshore around northern Channel Islands and P.M.T.C.; somewhat reduced concentrations in March.
Red phalarope (<u>Phalaropus fulicarius</u>)	Present Aug. - May; scattered through inshore and offshore waters with moderate densities over and beyond Santa Rosa-Cortes Ridge in Nov. - Dec.
Northern phalarope (<u>Phalaropus lobatus</u>)	Present at scattered locations among northern Channel Islands and San Pedro Channel in April - May; most numerous in waters inshore of the Santa Rosa-Cortes Ridge.
Pomarine jaeger (<u>Stercorarius pomarinus</u>)	Present Aug. - May; scattered in offshore waters between the Channel Islands and the mainland; highest densities between Sept. - Nov.; most common far out to sea over offshore banks and ridges.

and observation data, described more fully below, indicate that during the breeding season some species prefer to forage over the island shelves which may vary from 3 to 6 nmi (4.8 to 9.6km) in width. The birds found in island breeding colonies may, therefore, be among those most dependent on the waters around the northern Channel Islands and Santa Barbara Island. If nesting birds must use more distant feeding areas, the energy (food) expended in travel to and from these more remote waters could decrease the amount of regurgitated food available for chicks and potentially reduce the number of successfully reared young.

The islands surrounded by the waters under consideration provide rookery areas for 9 of the 12 species of nesting marine birds in the Bight (see Table E-8 and Figures E-8, 9, 10, 11, and 12); the remaining 3 species breed only on the mainland. The approximately 15,700 to 19,800 nesting pairs of seabirds on the northern Channel Islands and Santa Barbara Island include the Bight's most important rookeries. Table E-9 shows that both in numbers and species diversity, the San Miguel-Prince Island complex is the single most important rookery in the Bight; the area is also the largest marine bird rookery in southern California (U.S. Bureau of Land Management, 1979). Anacapa Island supports the second largest number of seabirds including a rookery for the endangered brown pelican. Colonies found on Santa Barbara Island are the third largest in the Bight and support rookeries for the Xantus' murrelets.

Although most of the 9 species found nesting on these islands are known to have once bred on the mainland, intensive development along most mainland coasts now restricts breeding habitat to offshore islands. Reduction of habitat, along with other factors, has reduced present populations of pelican, cormorant, and auklet

Table E-8. Known marine bird colonies located on the northern Channel Islands and Santa Barbara Island. (Modified from: University of California Santa Cruz, 1976; Resources, 1978).

LOCATION	BREEDING SPECIES	ESTIMATED POPULATION 1975-1976
Castle Rock (San Miguel Is.)	Pigeon guillemot	80
	Brandt's cormorant	432
	Cassin's auklet	NC*
	Pelagic cormorant	30
	Xantus' murrelet	50
San Miguel Island	Pigeon guillemot	280
	Pelagic cormorant	62
	Brandt's cormorant	84
Prince Island (San Miguel Is.)	Western gull	1,200
	Cassin's auklet	20,000
	Brandt's cormorant	1,720
	Pigeon guillemot	400
	Double crested cormorant	40-80
	Ashy storm petrel	NC*
Santa Rosa Island	Pelagic cormorant	100
	Brandt's cormorant	10
	Brandt's cormorant	400
Gull Island (Santa Cruz Is.)	Cassin's auklet	138
	Western gull	62
	Brandt's cormorant	46
	Pelagic cormorant	34
Scorpion Rock (Santa Cruz Is.)	Western gull	200
	Brown pelican	80
Anacapa Island	Western gull	200-6,000
	Brown pelican	424
	Pigeon guillemot	8
	Pelagic cormorant	2
	Brandt's cormorant	2
	Xantus' murrelet	2
Santa Barbara Island (including Sutil Rock)	Double crested cormorant	24
	Brandt's cormorant	240
	Pelagic cormorant	2
	Western gull	2,324
	Xantus' murrelet	2,000
	Pigeon guillemot	160

*NC = No Count Available

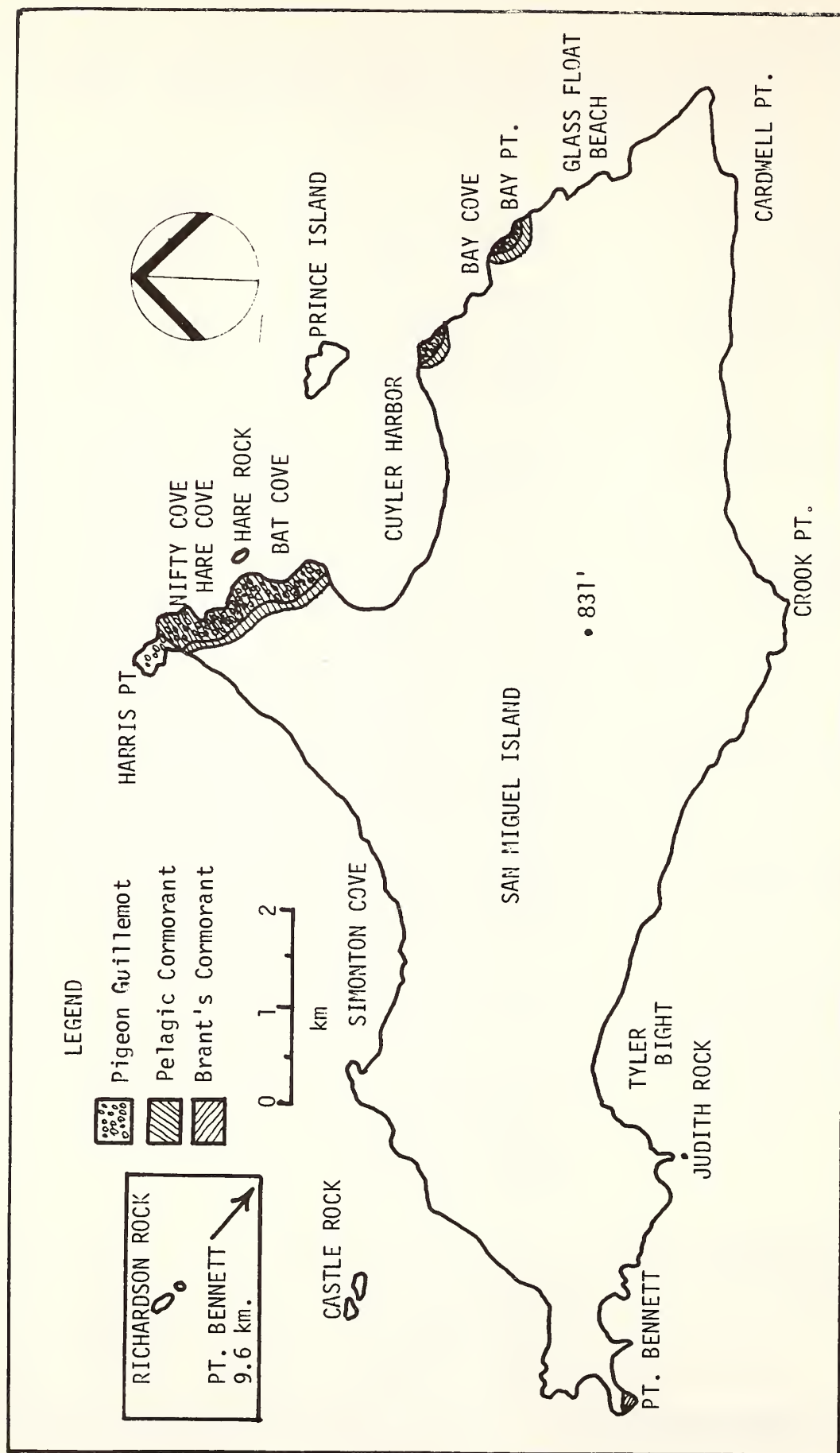


FIGURE E-8. Distribution of nesting colonies on San Miguel Island (University of California, Santa Cruz, 1976).

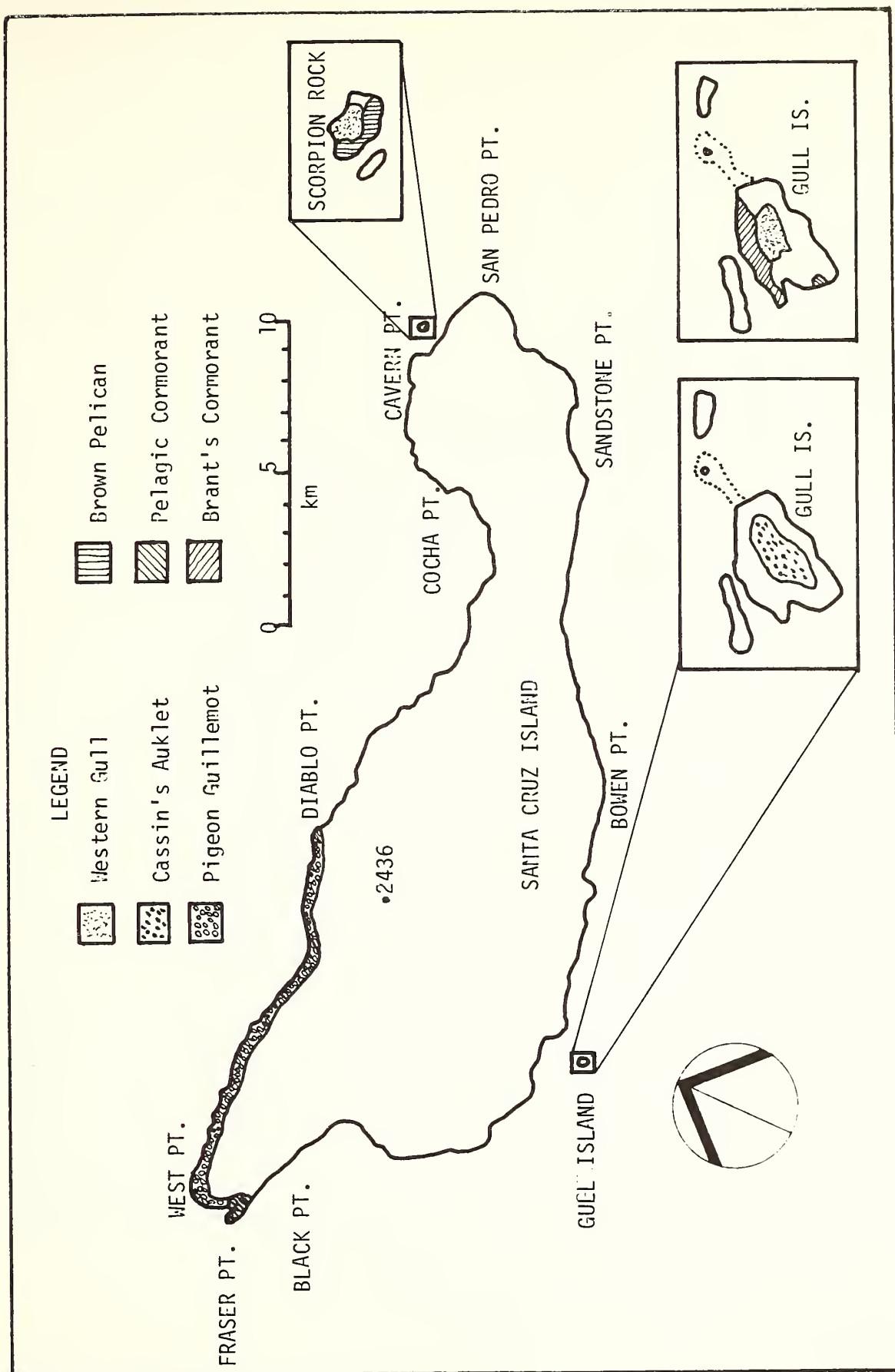


FIGURE E-9. Distribution of nesting colonies at Santa Cruz Island. Distributions of Brant's and double-crested cormorants incompletely known. (University of California, Santa Cruz, 1976).

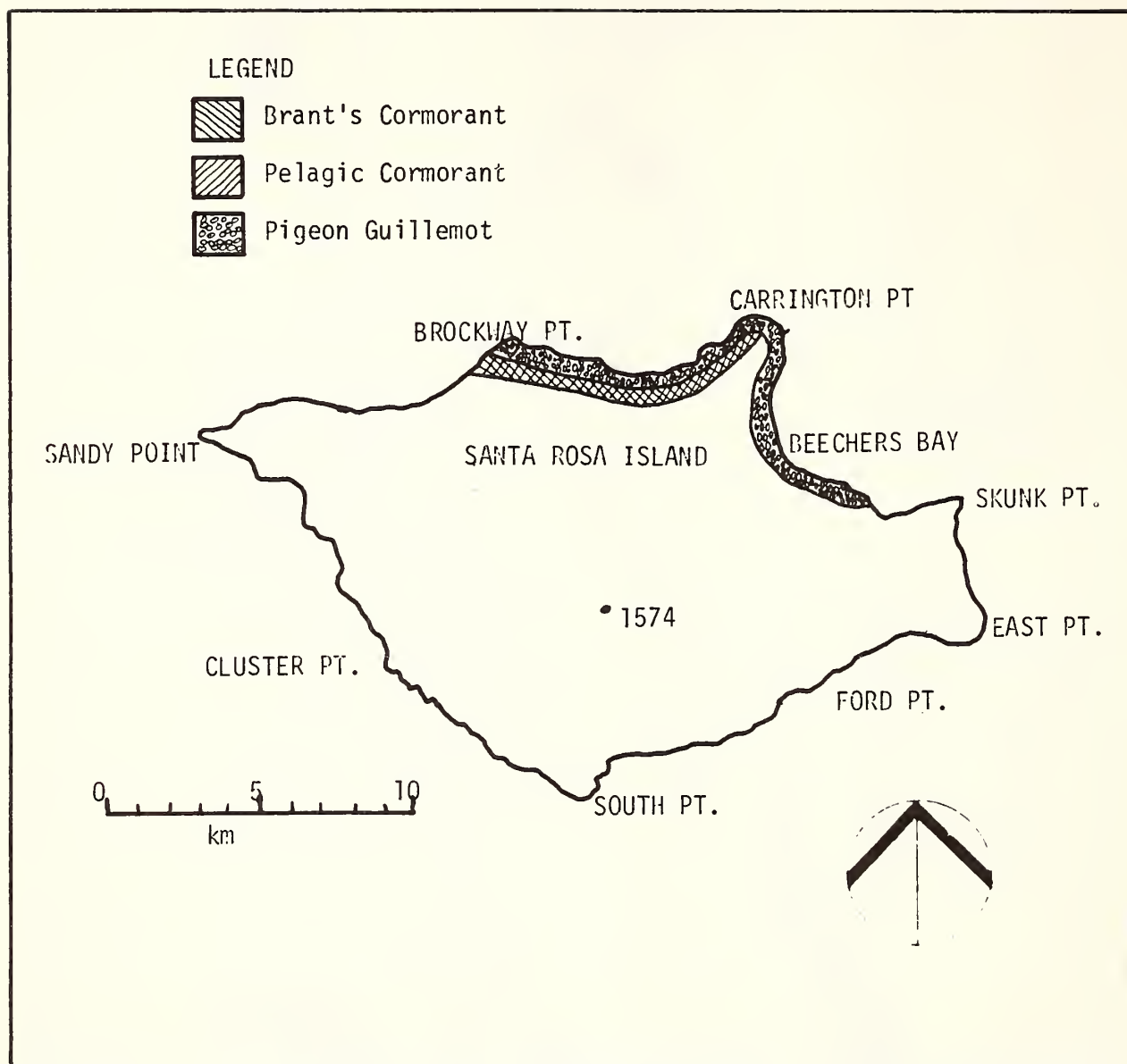


FIGURE E-10. Distribution of nesting colonies on Santa Rosa Island. Distributions of Brandt's cormorant and pigeon guillemot incompletely known. (University of California, Santa Cruz, 1976).

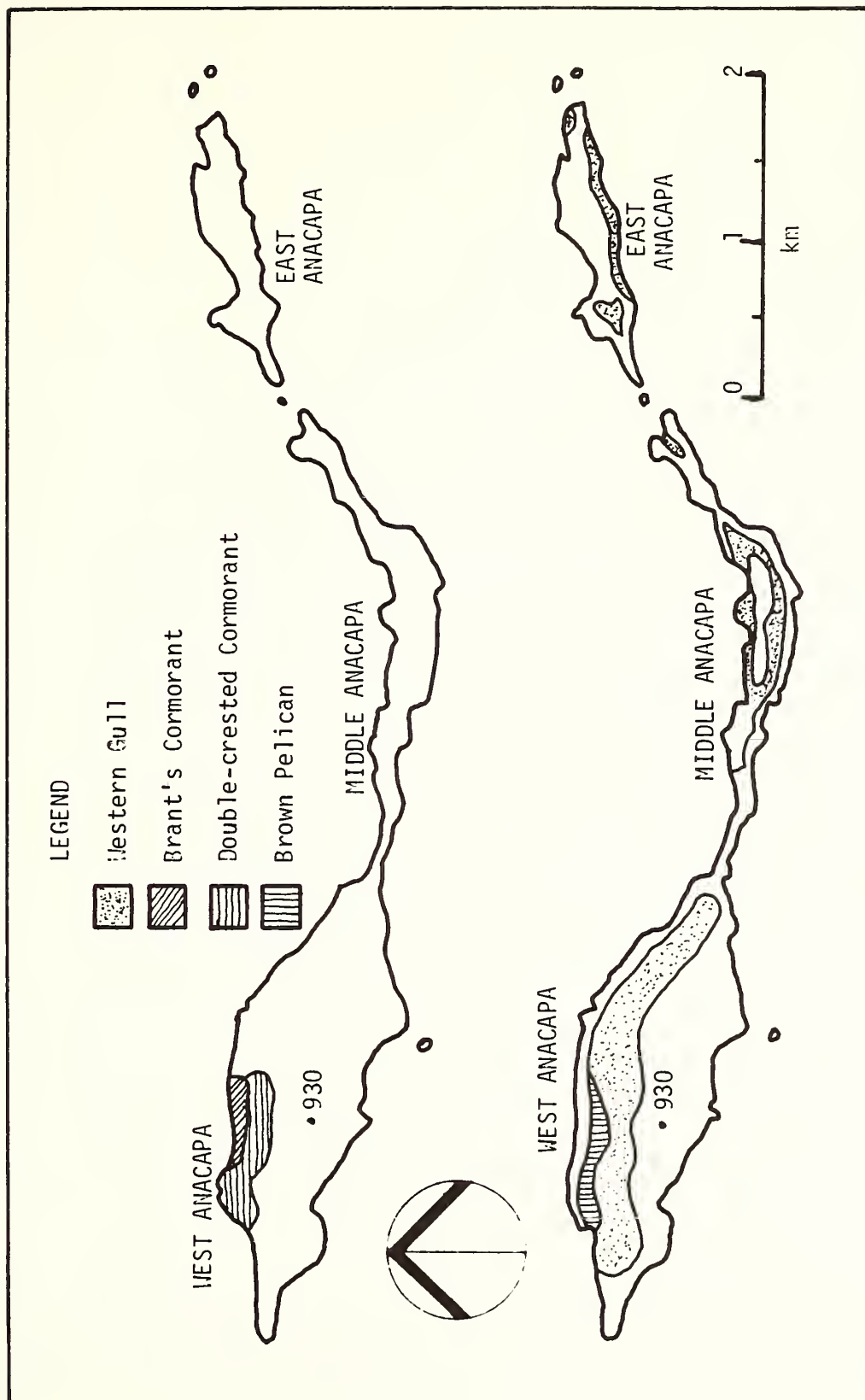


FIGURE E-11. Distribution of nesting colonies on Anacapa Island (Distribution of Brandt's cormorant incompletely known). (University of California, Santa Cruz, 1976.)

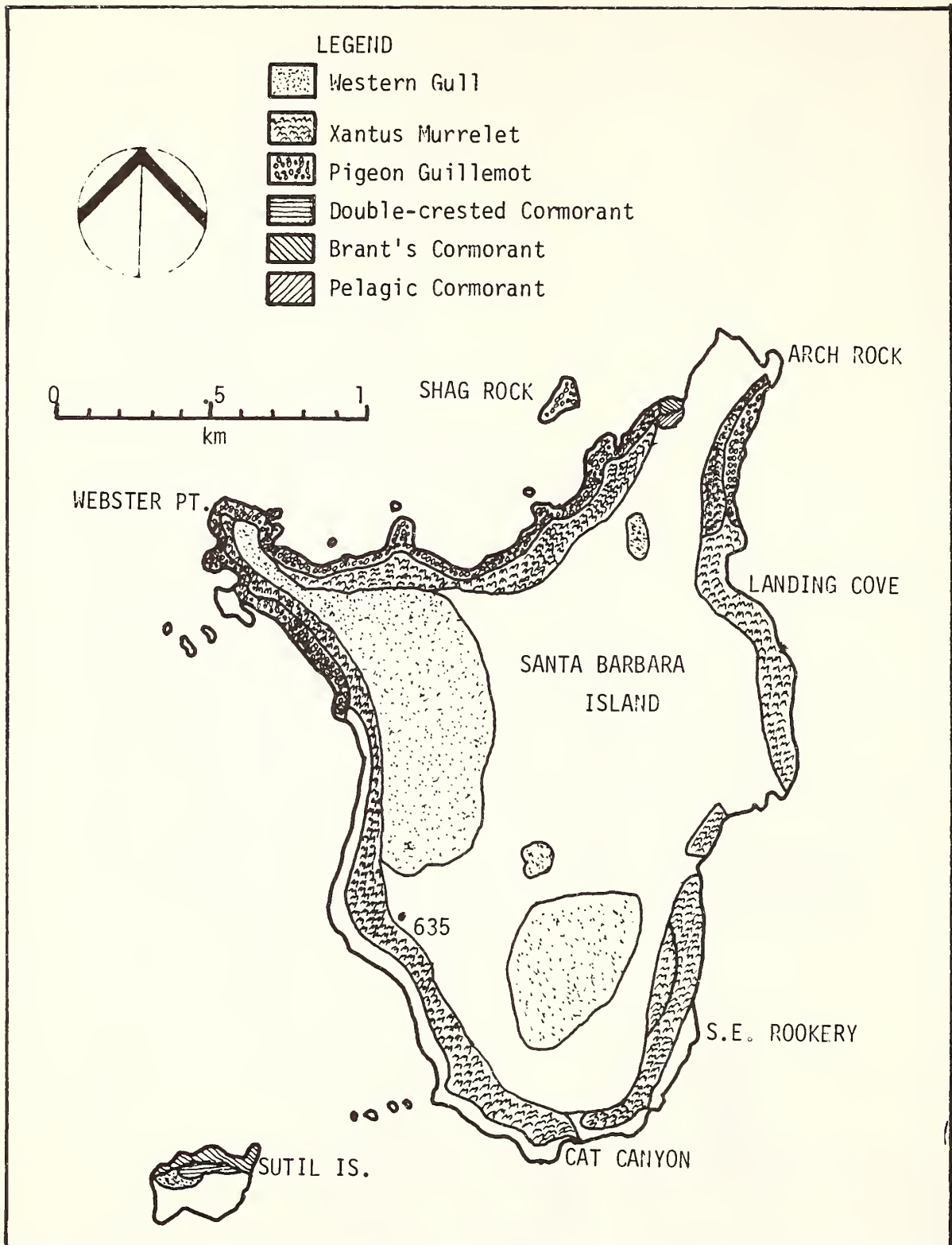


FIGURE E-12. Distribution of nesting colonies of seabirds on Santa Barbara Island (University of California, Santa Cruz, 1976).

TABLE E-9. Numbers of seabird pairs nesting on the California Channel Islands in 1975 (University of California, Santa Cruz, 1976).

Island	Species								
	ASP	BP	DC	BC	PC	WG	PG	XM	CA
1. San Miguel	?	-	-	42	31	+	140	?	?
Castle Rk.	?	-	-	216	15	+	40	?	+
Prince Is.	+	-	20-40	860	1	600	200	+	10,000
Richardson Rk.	?	-	-	-	-	?	-	-	?
2. Santa Rosa Is.	?	-	-	200	+	+	+	?	?
3. Santa Cruz Is.	?	-	-	?	?	?	+	?	?
Gull Is.	?	-	-	23	4	31	-	?	30
Scorpion Rk.	?	80	-	?	-	50	1	?	?
4. West Anacapa Is.	?	212	+	1	1	+	?	?	?
Middle Anacapa Is.	?	-	-	-	-	1000	-	?	?
East Anacapa Is.	?	-	-	-	-	3000	-	?	?
5. Santa Barbara Is.	?	-	2	27	1	1162	60 ca.1000	?	?
Sutil Is.	?	-	8	93	-	?	20	?	?
Shag Rk.	?	-	-	-	-	?	?	?	?
6. Santa Catalina Is.	?	-	-	-	-	?	-	?	?
Bird Rk.	?	-	-	-	-	25-30	-	?	-
Ship Rk.	?	-	-	-	-	-	-	?	-
7. San Nicolas Is.	?	-	-	365	-	720	-	?	?
8. San Clemente Is.	?	-	-	12	-	?	-	?	?
Castle Rk.	?	-	-	1	-	?	-	?	?
Bird Rk. (NW Harbor)	-	-	-	-	-	31	-	-	-

Symbols: - = not present; ? = possibly present, but not found; + = present, but no estimate of numbers obtained.

ASP = Ashy stormy petrel
 BP = Brown pelican
 DC = Double-crested cormorant
 BC = Brandt's cormorant
 WG = Western gull

PG = Pigeon guillemot
 XM = Xantus' murrelet
 CA = Cassin's auklet
 PC = Pelagic cormorant

to only a fraction of their former numbers. Two other marine species which nested in the Channel Islands 75 years ago (the tufted puffin and common murrelet) no longer nest there. As noted above, the brown pelican is listed as endangered on the U.S. Fish and Wildlife Service's Endangered Species List. In addition to seabirds, two land-oriented species also designated as endangered (the bald eagle and the peregrine falcon) once nested on the northern Channel Islands but have not been observed in the area for several years. These two species, although known to feed along beaches and over waters very close to the coast, are not true seabirds.

Although distribution and movement vary between species and time of year, seabirds, like marine mammals, tend to concentrate over areas of high bottom relief including ridges, island shelves, and plateaus. During summer, for example, the brown pelican, western gulls, and Cassin's auklets in the Bight are found in greatest numbers northwest of San Miguel Island, in the eastern end of Santa Barbara Channel, close inshore around all eight islands, and in waters overlying the northern Santa Rosa-Cortes Ridge and Santa Cruz Basin (University of California, Santa Cruz, 1976).

As mentioned above, nesting birds have been observed to forage in waters close to their rookeries, usually within several miles of shore. For example, the three species of cormorants, pelican, Xantus' murrelet, and pigeon guillemot were predominantly within 6 nmi (10km) of their colonies while Cassin's auklets concentrated between 6 to 15 nmi (10 to 25km) offshore (University of California, Santa Cruz, 1976). Radio telemetry studies on the movements of radio-banded Xantus' murrelets and western gulls at Santa Barbara Island and transects for Cassin's auklet at San Miguel Island and Xantus' murrelet at Santa Barbara Island also demon-

strate patterns of movement close to island shores. The relative importance of the waters near the northern Channel Islands and Santa Barbara Island for all species of marine birds is indicated by the large number of individuals sighted there as compared to the other more southern Channel Islands (see Table E-10).

Seabirds also tend to feed in the kelp bed canopy. Kelp, as discussed below in Section E.2.c, grows principally on rocky bottom areas shallower than 100 ft (30m). The kelp canopy provides a resting and foraging ground to many seabirds (California Department of Fish and Game, 1979). For instance, the great blue heron uses the surface kelp as a platform from which it hunts. The pigeon guillemot swims within the forests for its prey. The brown pelican plunges after fish in clear water between the canopy growth. Cormorants also feed about the kelp. Gulls of many species and sea ducks use the kelp canopy and clear water between as resting areas. Some examples are:

<u>Larus occidentalis</u>	Western gull
<u>Larus californicus</u>	California gull
<u>Larus philadelphus</u>	Bonaparte's gull
<u>Melanitta deglandi</u>	White-wing scoter
<u>Melanitta perspicillata</u>	Surf scoter
<u>Aythya affines</u>	Lesser scaup

Marine birds as a predatory group are one of the most important food chain consumers in the Bight along with pinnipeds, cetaceans, and man. Although their principal food sources are poorly known and vary by species, squid and small schooling fish such as anchovies, sardines, and saury probably predominate. Estimates of annual consumption are not available, but as a major predator at the top of the food chain, their importance in maintaining a

Table E-10 Sightings of all species combined (total individuals) on and near Channel Islands and beaches, April 1975 through March 1976. Dash indicates area not surveyed or survey incomplete (University of California, Santa Cruz, 1976).

<u>Location</u>	<u>Apr-Jun 75</u>	<u>Jul-Sep 75</u>	<u>Oct-Dec 75</u>	<u>Jan-Mar 75</u>
SAN MIGUEL ISLAND				
Richardson Rock	102	233	179	93
West	1427	1313	1365	810
South	304	194	372	216
East	1846	894	1616	755
North	130	272	245	281
SANTA ROSA ISLAND				
West	289	188	1563	633
South	80	116	613	2756
East	437	653	626	1136
North	691	822	734	546
SANTA CRUZ ISLAND				
West	163	247	749	186
South	230	442	783	1454
East	375	356	928	173
North	582	448	632	502
ANACAPA ISLAND				
	1865	--	--	7482
SAN NICOLAS ISLAND				
Northwest	140	587	1756	1513
Southwest	69	25	78	95
Southeast	37	0	1608	944
Northeast	127	477	302	416
SANTA BARBARA ISLAND				
	1187	597	2141	813
SANTA CATALINA ISLAND				
Northwest	11	63	103	852
Southwest	84	40	120	1171
South	48	13	24	94
East	43	54	34	1620
Isthmus	56	65	41	1096
SAN CLEMENTE ISLAND				
Northwest	303	571	790	2141
West Central	66	130	611	579
Southwest	18	42	161	107
Pyramid Cove	10	29	40	0
East	30	0	0	16

balance in the Bight's species diversity and abundance is undoubtedly significant.

The shallow island shelf waters surrounding the northern Channel Islands and Santa Barbara Island provide significant feeding areas for the largest concentrations of seabirds in the Southern California Bight. From an ecologic point of view, this concentration of top predators represents a significant factor determining the Bight's trophic (food) pathways. The breeding colonies of seabirds on the islands represent remnants of former ranges that once included mainland areas. Now, however, most mainland breeding colonies south of Point Conception have been destroyed (California Department of Fish and Game, 1979).

The marine feeding areas in waters surrounding these remaining rookeries provide significant food sources to support these breeding colonies. The large concentrations of marine birds also afford exceptional research opportunities, particularly for the study of ecologic pathways related to the birds, as well as an important resource for ornithologists and nature lovers.

E.2.c. Fish and Plant Resources

Marine fish resources, finfish, invertebrates, and plants, are discussed below under two groupings: nearshore species (found in waters shallower than 180 ft (55m) and offshore species (found in water of greater depths). The outer margin of the nearshore zone approximates the depth at which the island shelf plunges down a steeper slope to the deeper offshore basins, plateaus, and submerged ridges. In most cases, the division between the two zones is 3 to 6 nmi (4.8 to 9.7km) from shore.

California's nearshore fish assemblage (i.e., fish favoring the island and mainland shelves) has been found by Horn (1974) to include some 213 species, or about 44 percent of all species reported by Miller and Lea (1972) to occur in all southern California waters (U.S. Bureau of Land Management, 1979). This diversity (Figure E-13) is at least partly due to the convergence near the northern Channel Islands of two major biogeographic regions. A detailed list of all fish in the island shelf area of the northern Channel Islands and Santa Barbara Island has not been compiled.

The California Department of Fish and Game (1979) has identified fish species of recreational and commercial interest that occur off each of the northern Channel Islands and Santa Barbara Island (see Appendix 2). Among the more notable finfish are the rockfishes and surfperches. Among the invertebrate and plant species are the abalones (red, black, white, pink), rock scallops, California sea mussels, piddocks, sea urchins, lobster, bay mussels and kelp. The most frequently occurring shellfish on the island shelves are the bivalves Parvilucina tenuisculpta and Tellina carpenteri (U.S. Bureau of Land Management, 1979). Two of the most prominent nearshore marine habitats are the kelp bed/rocky bottom areas and the sand flat areas. Of these, kelp beds are the most important island shelf habitat in terms of diversity and abundance of fish species.

Kelp beds only grow on rocky bottom areas with depths between 9 to 284 ft (3 to 86m). Greatest abundances occur between about 25 to 100 ft (8 to 30m).

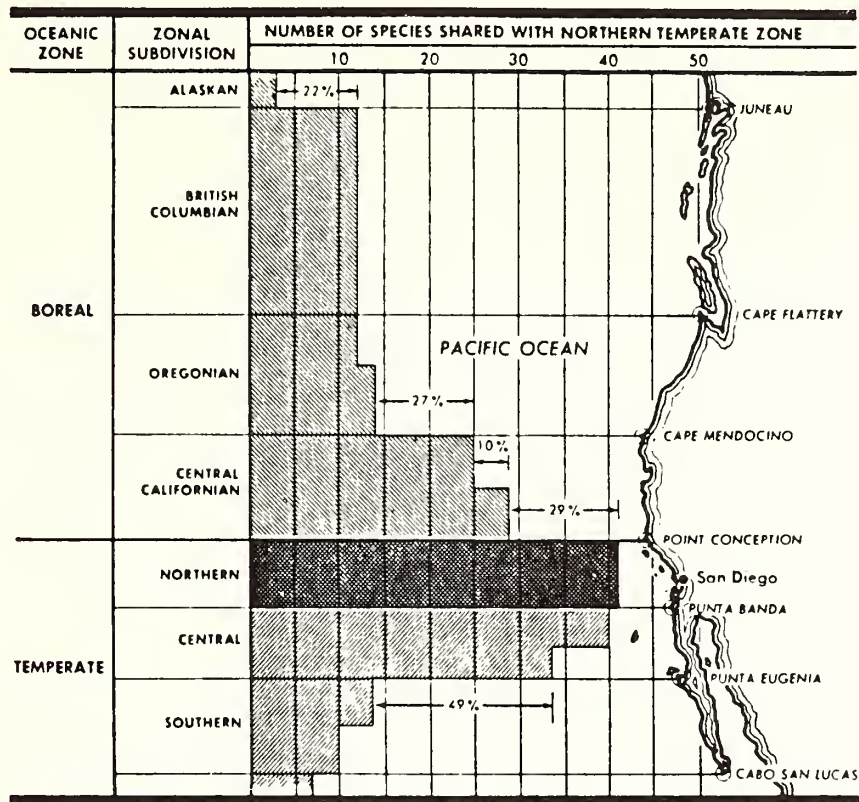


FIGURE E-13. Diversity of fish species along the Pacific coast (North and Hubbs, 1968).

The U.S. Bureau of Land Management (1979) identifies the abundant kelp beds off the island's shores (Figure E-14) as a major reason behind its (BLM's) conclusion that island waters represent one of the most important of southern California's marine habitats. They describe this vital resource as follows (U.S. Bureau of Land Management, 1979):

"About 40 percent of all the kelp beds in the Southern California Bight occur around the Channel Islands. These kelp beds are some of the most highly developed submarine forests in the world. Over 800 plant and animal species are known to be associated with these kelp beds including many valuable sport and commercial species."

Kelp beds (see Figure E-15) offer sessile, resident, and transient marine life protection, food, and special benthic (in holdfasts) and pelagic (stipes, fronds, and canopy) niches. Southern California kelp beds harbor some 125 fish species although perhaps only 20 or 30 are common (Quast, 1968). Ebeling et al. (In process) reports that most fish species prefer either the bottom or canopy zones, bypassing the intermediate depths.

Particularly important to repopulation rates, many kelp bed fishes such as the kelp bass and some rockfish show little seasonal movement. Ebeling et al. (In process) cite sources which state that adults of kelp bed fish may spend most of their lives within an area of but a few hundred square yards. Ebeling et al. (In process) also suggest that northern Channel Island kelp bed fishes tend to have a higher fish density and diversity than do mainland

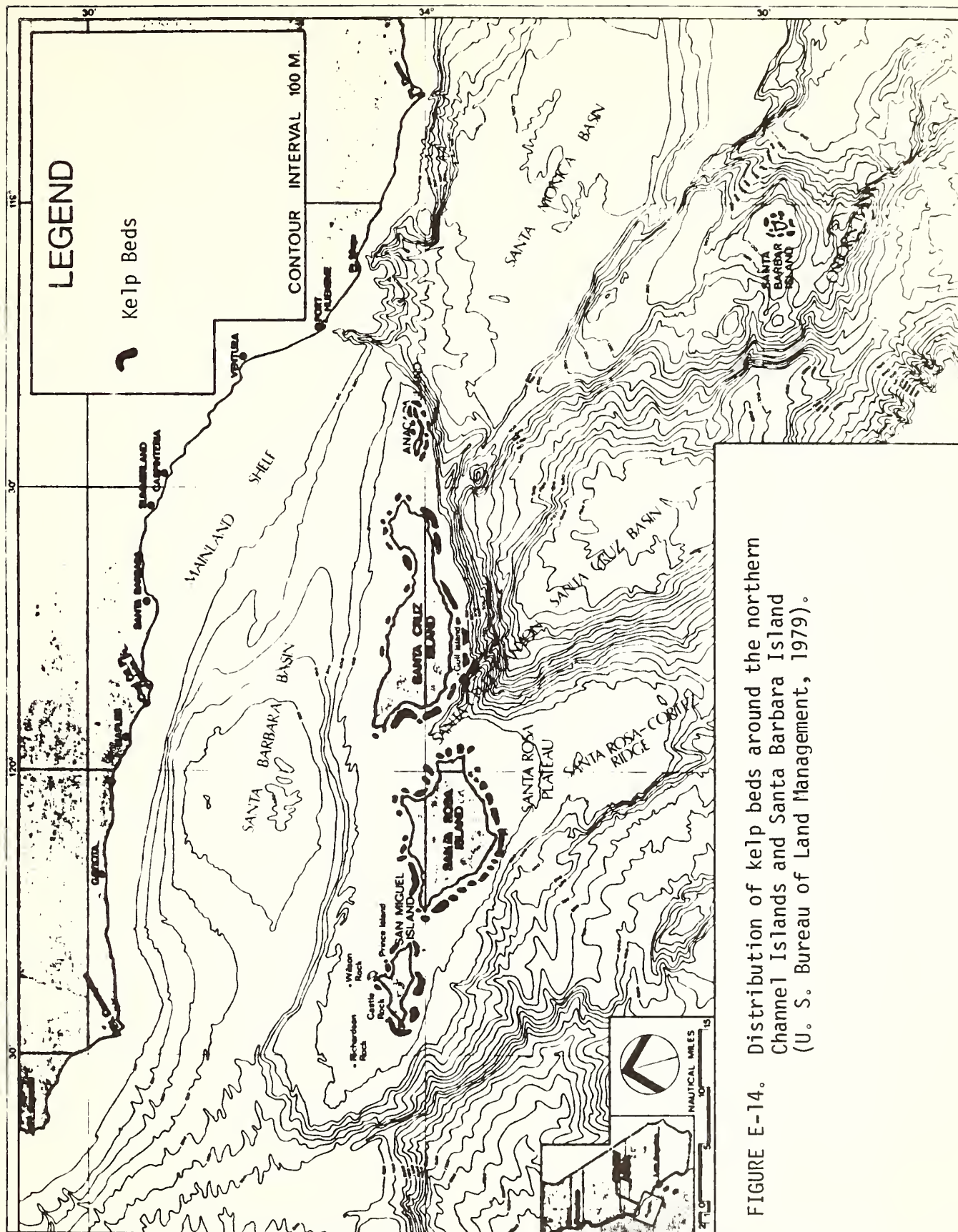


FIGURE E-14. Distribution of kelp beds around the northern Channel Islands and Santa Barbara Island (U. S. Bureau of Land Management, 1979).

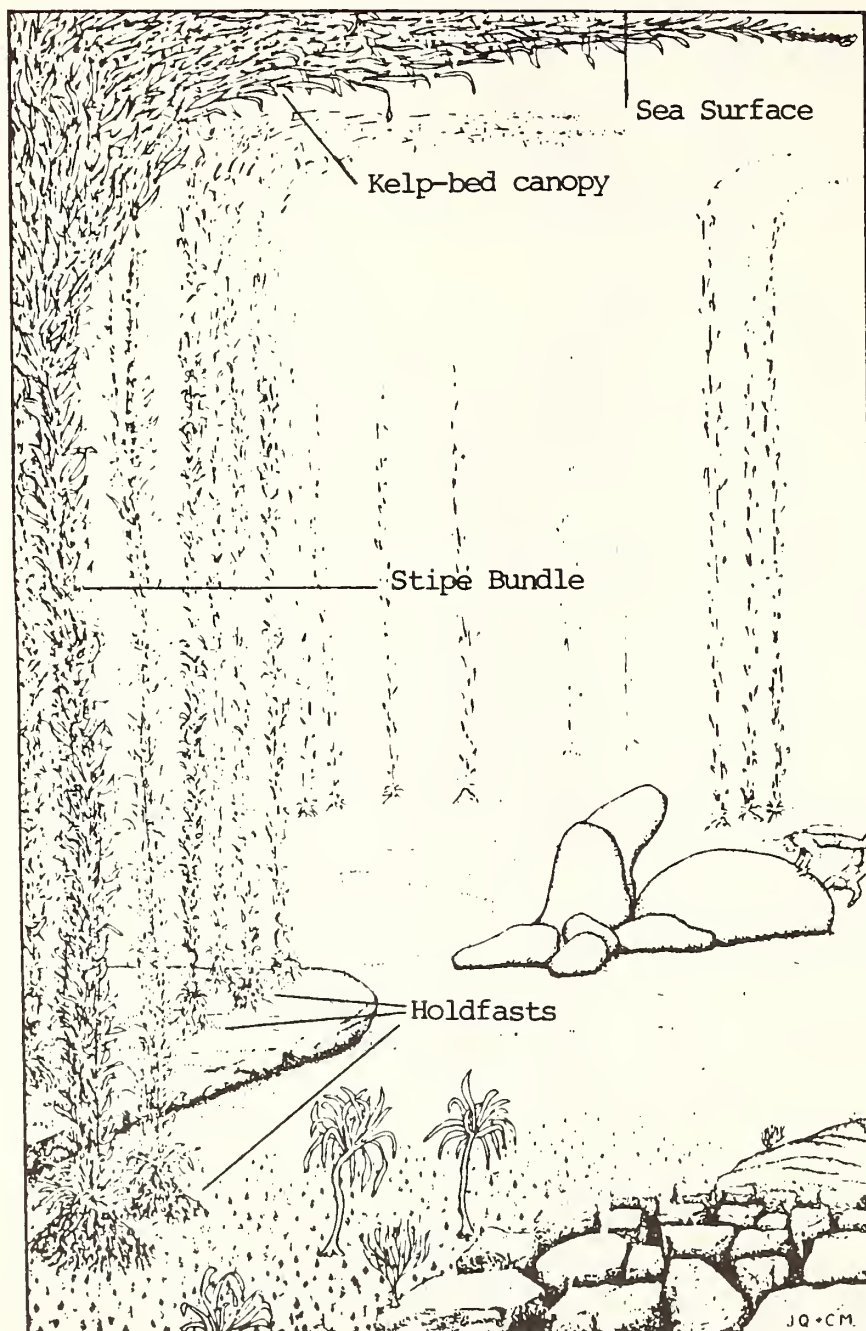


FIGURE E-15. Underwater diagram of a kelp bed (North and Hubbs, 1968).

beds. They attribute this "island effect" to habitat differences such as clearer water, more continuous high-relief rocky bottom, and perhaps more fish food on the island shelves.

Many of the fish species found in more open waters over island sand flats and in offshore pelagic areas beyond the island shelves are presented in Appendix 2. In these areas, the small schooling species such as the northern anchovy, Pacific saury, sardine, mackerel, and squid are particularly important because of their vital role in the marine food chain. The nutrient rich waters fed by regional upwellings support exceptionally abundant populations of these species which in turn are fed upon by other fish, the seabirds, marine mammals, and humans. The abundance of these fish is undoubtedly a significant factor supporting the large concentrations of marine mammals and seabirds in the area.

The northern Channel Islands' surrounding marine waters are also important habitat for the hydrocoral Allopora californica. With an incomplete sampling record, it is difficult to call this a rare or endangered species; however, the species is presently known in only 9 locations nationwide, 6 of which are around the northern Channel Islands. The U.S. Bureau of Land Management (1979) cites this finding as a principal reason for identifying these southern California offshore islands as one of Southern California's most important marine habitats.

In general, the fish resources around the northern Channel Islands and Santa Barbara Island include a species array representative of the high diversity of fish found throughout the Southern California Bight. As indicated in commercial and recreational catch statistics maintained by the California Department of Fish and Game (discussed more completely under fishing and plant

harvesting in Section E.3.c.), many of these species are found in abundance.

E.2.d. Intertidal Organisms

The intertidal habitats on the northern Channel Islands and Santa Barbara Island include primarily rocky shorelines with some scattered sandy beaches. This is in contrast to the mainland shoreline which is only 20 percent rocky (U.S. Bureau of Land Management, 1979).

Rocky intertidal shorelines are an important marine habitat zone in southern California. Describing these areas, the Southern California Ocean Sciences Studies Consortium (1974) states that "...the intertidal area of a rocky coast is considered to have the greatest diversity of plant and animal life of any ecological area. Few major habitats so clearly show richness and variety of life." A variety of marine organisms characterize this habitat, including encrusting abalone, barnacles, and limpets, several species of attached marine algae, starfish, sea urchins, tidepool fish, foraging shorebirds, and marine mammals (see Table E-11).

Sandy beaches extend over a much smaller stretch of the island shorelines and provide habitat to fewer marine organisms; nevertheless, quite a few species occur in this habitat, including burrowing clams, amphipods, isopods, and other invertebrates. The area provides an important feeding habitat for several species of shore birds. Marine mammals using the upper beach for haulout purposes must pass through the area when moving from the water to shore.

TABLE E-11. Examples of intertidal species of the northern Channel Islands and Santa Barbara Island (California Department of Fish and Game, 1979).

ROCKY INTERTIDAL HABITAT

Chlorophyta - green algae	
<u>Enteromorpha</u> spp.	<u>Chaetomorpha spiralis</u>
<u>Urospora wormskioldii</u>	<u>Codium curreatum</u>
Phaeophyta - brown algae	
<u>Pachydictyon coriaceum</u>	<u>Hesperophycus harveyanus</u>
<u>Taonia lennebackariae</u>	<u>Dictyoneuropsis reticulata</u>
<u>Eisenia arborea</u>	<u>Pelvetia fastigiata</u>
Rhodophyta - red algae	
<u>Porphyrella californica</u>	<u>Gloriopeltis furcata</u>
<u>Acrochaetium barbadense</u>	<u>Iridaea flaccida</u>
<u>Acrochaetium pacificum</u>	<u>Iridaea lineara</u>
<u>Helminthora stricta</u>	<u>Botryocladia neushulii</u>
<u>Gelidium robustum</u>	<u>Callithamnion rupicolum</u>
<u>Bossiella californica</u>	<u>Endocladia muricata</u>
Porifera - sponges	
<u>Esperiopsis originalis</u>	<u>Leuconia heathi</u>
<u>Isociona lithophoenix</u>	<u>Rhabdodermella nuttingi</u>
Coelenterata - hydroids, sea anemones, etc.	
<u>Abietinaria amphora</u>	<u>Plumularia alica</u>
<u>Aglaophenia struthionides</u>	<u>Synthechium cylindricum</u>
<u>Anthopleura elegantissima</u>	<u>Epiactis prolifera</u>
Annelida - worms	
<u>Arabella iricolor</u>	<u>Sabellaria californica</u>
<u>Nereis pelagica</u>	<u>Salmacina tribranchiata</u>
Echinodermata - starfish, sea urchins, sea cucumbers, brittle stars, etc.	
<u>Astrometis sertulifera</u>	<u>Patiria miniata</u>
<u>Pisaster giganteus</u>	<u>Pisaster ochraceus</u>
<u>Strongylocentrotus franciscanus</u>	<u>Cucumaria lubrica</u>
<u>Strongylocentrotus purpuratus</u>	<u>Amphipholis squamata</u>
<u>Amaroucium aequali siphonis</u>	<u>Duherdmania claviformis</u>
<u>Archidistoma psammion</u>	
Mollusca - limpets, snails, octopus, etc.	
<u>Nuttallina californica</u>	<u>Littorina scutulata</u>
<u>Acmaea digitalis</u>	<u>Acanthina spirata</u>
<u>Acmaea scabra</u>	<u>Tegula funebris</u>
<u>Fussurella volcana</u>	<u>Cypraea spadicea</u>
<u>Haliotis cracherodii</u>	<u>Mytilus californianus</u>
<u>Littorina planaxis</u>	<u>Haliotis fulgens</u>
<u>Octopus bimaculatus</u>	<u>Chama pellucida</u>

TABLE E-11 Cont.

Arthropoda - barnacles, crabs, isopods, amphipods, shrimps, etc.

<u>Hyale frequens</u>	<u>Alpheus clamator</u>
<u>Cirolana harrfordi</u>	<u>Cancer jordanii</u>
<u>Ligia occidentalis</u>	<u>Pachygrapsus crassipes</u>
<u>Crago nigricauda</u>	<u>Pagurus hirsutiusculus</u>
<u>Balanus glandula</u>	<u>Mitella polymerus</u>
<u>Balanus tintinnabulum</u>	

Osteichthyes - boney fishes

<u>Cebidichthys violaceus</u> (monkeyface eel)
<u>Micrometrus aurora</u> (reef surfperch)
<u>Oligocottus snyderi</u> (fluffy sculpin)
<u>Xiphister atropurpureus</u> (black prickleback)
<u>Gibbonsia elegans</u> (spotted kelpfish)
<u>Gibbonsia metzi</u> (striped kelpfish)
<u>Girella nigricans</u> (opaleye)
<u>Clinocottus recalvus</u> (bald sculpin)
<u>Xerorpes fucorum</u> (rockweed gunnel)

Aves - shore birds

<u>Haematopus palliatus frazari</u> (American oystercatcher)
<u>Haematopus bachmani</u> (black oystercatcher)
<u>Aphriza virgata</u> (surfbird)
<u>Arenaria melanocephala</u> (black turnstone)
<u>Heteroscelus incanus</u> (wandering tattler)

Pinnipeds - seals and sea lions

<u>Zalophus californianus</u> (california sea lion)
<u>Phoca vitulina</u> (harbor seal)
<u>Mirounga angustirostris</u> (northern elephant seal)

SANDY INTERTIDAL HABITAT

Mollusca - clams

<u>Tivela stultorum</u>	<u>Olivella biplicata</u>
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Arthropods - crabs, amphipods, isopods, etc.

<u>Alloniscus pereinexus</u>	<u>Orchestoidea californiana</u>
<u>Lepidopa californica</u>	<u>Lophopanopeus heathii</u>
<u>Emerita analoga</u>	

Aves - shore birds

<u>Squatarola squatarola</u> (black-bellied plover)
<u>Limosa fedoa</u> (marbled godwit)
<u>Numenius phaeopus</u> (whimbrel)
<u>Catoptrophorus semipalmatus</u> (willet)
<u>Crocethia alba</u> (sanderling)

Because the northern Channel Islands are remote and thus, until recently, subject to little human disturbances, the island intertidal areas include some of the best representative areas in southern California. Mainland intertidal areas, which are more easily accessible to the public and used intensively as areas for specimen collecting, are typically in poorer condition than comparable island areas.

E.2.e. Cultural and Historic Resources

Cultural and historic resources located in the marine waters surrounding the northern Channel Islands and Santa Barbara Island include underwater archaeological sites and artifacts and ship and aircraft wrecks. No extensive onsite inventory of the cultural and historic resources of the study area has yet been conducted, although Science Applications, Inc. (1978) conducted a thorough survey of the relevant literature for the Southern California Bight for BLM.

Numerous archaeological and paleontological resources exist on the land areas of the northern Channel Islands and Santa Barbara Island (U.S. Bureau of Land Management, 1978c). It has been determined with an acceptable degree of accuracy that sea levels were as much as 180 ft (55m) lower during previous eras of geologic time (Science Applications, 1978). Since known prehistoric sites on land document the presence of man in the Channel Islands area during these eras, it is generally thought that the exposed areas of the continental shelf were extensively inhabited (Science Applications, 1978). The potential exists, therefore, that undiscovered archaeological sites are present in the submerged lands of the study areas. The BLM literature survey (U.S. Bureau

of Land Management, 1978c) mapped three zones of different probability levels for the presence of cultural resources. The zone of highest probability was the area from 0 to 330 ft. (0 to 100m) in depth, where all known sites have been discovered. Medium and low probability zones 330 to 485 ft (100 to 150m) and deeper than 485 ft (150m) respectively are less likely to contain significant resources.

The discipline of underwater archaeology is relatively new and has not yet been extensively applied in the study area. As a result, most of the information which is currently available concerning underwater sites identified within the study area is based on the reports of amateur collectors and sport divers. The location and value of identified sites are depicted on Table E-12 and Figure E-16.

Due to natural hazards and prevailing current and weather patterns, the seas around the northern Channel Islands have been highly prone to shipwrecks throughout history. Such wrecks are of interest to historians as time capsules representing the period in which they sank and of interest to sport divers as marine habitat and curiosities. Science Applications, Inc. (1978) identifies 573 shipwrecks and 9 aircraft wrecks covering a period from approximately 1540 to the beginning of World War II in the Southern California Bight.

Table E-12. Shipwrecks recorded around the northern Channel Islands and Santa Barbara Island (U. S. Bureau of Land Management, 1979c).

<u>ID NO.</u>	<u>NAME</u>	<u>VESSEL TYPE</u>	<u>CAUSE</u>	<u>DATE OF SINKING</u>
<u>San Miguel Island</u>				
167 1	Comet	Schooner	stranded	8/30/11
194 1	Cuba	St. Scr.	stranded	9/8/23
415 1	J. M. Colman	Schooner	stranded	9/3/05
411 a	J. F. West	Schooner	sunk	1898
444 a	Kate & Annie		sunk	1902
661 a	Pectan			
1029 1	Unk.	Galleon	sunk	1801
1068 a	Watson A. West	Schooner	stranded	2/23/23
<u>Santa Rosa Island</u>				
17 1	Aggi	Steel 4-mast	sunk	5/2/15
199 1	Dora Bluhm	Schooner	stranded	5/25/10
192 1	Crown of England	St. Scr.	sunk	11/7/1894
101 a	Blue Fin	Oil Scr.	stranded	9/3/44
68 a	Aristocratis		sunk	1949
335 a	Goldenhorn	Barkentine	stranded	9/12/1892
1026 1	Unk.	Wreck		
<u>Santa Cruz Island</u>				
99 1	Black Dolphin	Barkentine	stranded	? dynamited
154 1	City of Sausalito	Oil Scr.	burned	12/11/41
82 a	Babina	Gas Scr.	burned	3/3/23
393 a	International No. 1	Barge	stranded	9/13/18
571 a	Nancy Lee		sunk	1946
888 a	Thornton		sunk	1910
1113 a	Yukon	Barge	sunk	1/6/38
<u>Anacapa Island</u>				
671 1	Pinnacle			
760 1	San Francisco	Oil Scr.	burned	10/31/49
86 a	Balboa	Oil Scr.	burned	1/18/49
260 a	Equator	Oil Scr.	sunk	7/2/49
467 a	Labor	Gas Scr.	sunk	10/2/24
1008 1		Diesel	sunk	?
1098 1	Winfield Scott	St. side wheel	stranded	12/2/1853
<u>Santa Barbara Island</u>				
13 a	Adriatic	Oil Scr.	sunk	12/28/30
Fed.207 1	Dante Aleghieri II	Gas Scr.	sunk	11/30/38
253 a	Emperor	Oil Scr.	sunk	7/15/32

E.3. Human Activities

E.3.a. Introduction

The northern Channel Island's proximity to one of the most heavily urbanized areas along the United States' west coast exposes the surrounding waters to many different (and often competitive) types of human activities. The following section describes the scale and intensity of the major area uses including oil and gas exploration and production, commercial and sport fishing, kelp harvesting, commercial shipping, military operations, scientific research, and recreation. Wherever possible, uses are identified on a site-specific basis and discussions of both current patterns and future trends are incorporated.

E.3.b. Oil and Gas Activities

Offshore oil and gas development began in the United States in the State tidelands of the Santa Barbara Channel in 1896. The first leases in State tidelands were sold in 1950. Development of the Federal OCS lands within the Channel began in 1966 with the sale of one drainage tract to allow development of a known field (Carpinteria) in Federal waters. In 1968, the first Federal lease sale was held in the Channel. Federal development in the Channel continued with OCS Lease Sale #35 in 1975 and Lease Sale #48 in June 1979. BLM plans to hold two additional sales in the Southern California Bight (which includes the Santa Barbara Channel) in the next five years; Sale 68 in 1982 and Sale 73 in 1983. Significant milestones in the history of oil and gas development in the Santa Barbara Channel and in the vicinity of the northern Channel Islands are summarized on Table E-13. Appendix 3 briefly reviews stages in the OCS oil and gas development process.

TABLE E-13. Milestones in Santa Barbara Channel and the Northern Channel Islands Area Oil and Gas Development.

<u>Date</u>	<u>Event</u>
1896	First offshore development occurred in the Santa Barbara Channel.
1950	California grants first leases in State tidelands of Santa Barbara Channel.
1966	State lands in Carpinteria field (state portion) leased.
1966	First Federal lease in Carpinteria field (federal portion).
1968	Additional Federal leases in the Santa Barbara Channel.
1969	Santa Barbara Oil Spill at Union's Platform A in the Dos Cuadras Field.
1975	OCS Lease Sale #35.
1978-1979	DES and FES on proposed Lease Sale #48.
1979	Lease Sale #48 held June 29.
1982	Lease Sale #68 proposed for Southern California (including Santa Barbara Channel) in July, 1982
1983	Lease Sale #73 proposed for California.

Table E-14 shows estimates of the magnitude of recoverable reserves near the northern Channel Islands. These estimates are an important factor in determining areas likely to be developed, as well as the amount and types of facilities to be used in the area.

Figure E-18 shows existing leases around the northern Channel Islands and Santa Barbara Island, the operators of these leases, and tracts subject to Sale #48; relevant tract numbers are shown on Figure E-19. Until now, most of the oil and gas activity in the area has occurred in the State tidelands and on those OCS leases closest to the mainland. Production platforms in the Channel area are shown on Table E-15; all of these are on tracts either in State waters or on OCS leases on the mainland side of the Channel. Platform Grace, once installed, will be the furthest platform offshore (approximately 10 nmi or 18.5km) and the closest to the northern Channel Islands (approximately 8 nmi or 14.8km from the tip of Santa Cruz Island). Several exploratory wells have been drilled close to the northern Channel Islands. Tracts on which wells have been drilled and the number of wells drilled per tract are shown on Table E-16.

Two plans for exploration on leases near the northern Channel Islands have recently been approved by the USGS and certified as consistent with California's coastal plan by the California Coastal Commission (CCC). The CCC found Chevron's exploration plan to drill four wells on tracts 204, 208, 209, and 215 (in the Santa Clara Unit) to be consistent with California's Coastal Plan on December 12, 1978 (California Coastal Commission, 1978). The most southerly of Chevron's proposed wells lies approximately 8 nmi (14.8km) north of the Anacapa Islands (Chevron, 1978). On March 23, 1979, the CCC also found Exxon's exploration plan to

TABLE E-14. Estimated Recoverable Reserves in the Northern Channel Islands Vicinity (From OCS Sales in 1966, 1968, Lease Sale #35, and Proposed Sale #48).

- (a) For the 63 leases sold in 1966 and 1968 (leases #166-241), BLM (1979) estimates the economically recoverable resources to be 610 million barrels of oil and 580 billion cubic feet of gas.
- (b) For the 56 leases sold in OCS Sale No. 35 (243-311) BLM (1979) estimates the economically recoverable resources to be 719 million barrels of oil and 997 billion cubic feet of gas.
- (c) The most probable undiscovered recoverable oil and gas resources* for all tracts (in the vicinity of the northern Channel Islands) originally subject to OCS Sale #48** are:

AREA	OIL (Million Barrels)	GAS (Billion Cubic Feet)
Total Sale 48 area**	715	860
Santa Barbara Channel	300	300
Santa Rosa Cortes North	15	23
Santa Barbara Island	10	8
24 tracts within the proposed marine sanc- tuary (later withdrawn from Sale 48)	5.7	8.9

In addition, Appendix 4 provides annual information (from 1979-2000) on the most probable oil and gas resources; the number of exploratory and development wells to be drilled; the number of platforms needed; and the amount of drill cuttings, muds, and formation water released, likely to result from proposed Sale #48 (as proposed in the FES (U.S. Bureau of Land Management, 1979).

*Undiscovered recoverable resources are defined as those quantities of oil and gas which are reasonably expected to occur in existing favorable geographic settings but are completely undiscovered, and which after discovery can be expected to be produced under present technology and economic conditions (U. S. Bureau of Land Management, 1979).

**Sale #48 - Revised USGS Estimates: The USGS substantially lowered its previous estimate to 104 million barrels of oil and 498 billion cubic feet of gas from Sale #48 (U.S. Department of Interior, 1979b).

It should also be noted that the Secretary of Interior deleted 69 tracts from proposed Sale #43 (see Figure E-17) and that 24 of these tracts (88-103 and 117-119 shown on Figure E-18 and E-19) are located in the vicinity of the northern Channel Islands (U.S. Department of Interior, 1979a). Because of these deletions, the resource estimates for Sale #48 would be reduced accordingly.

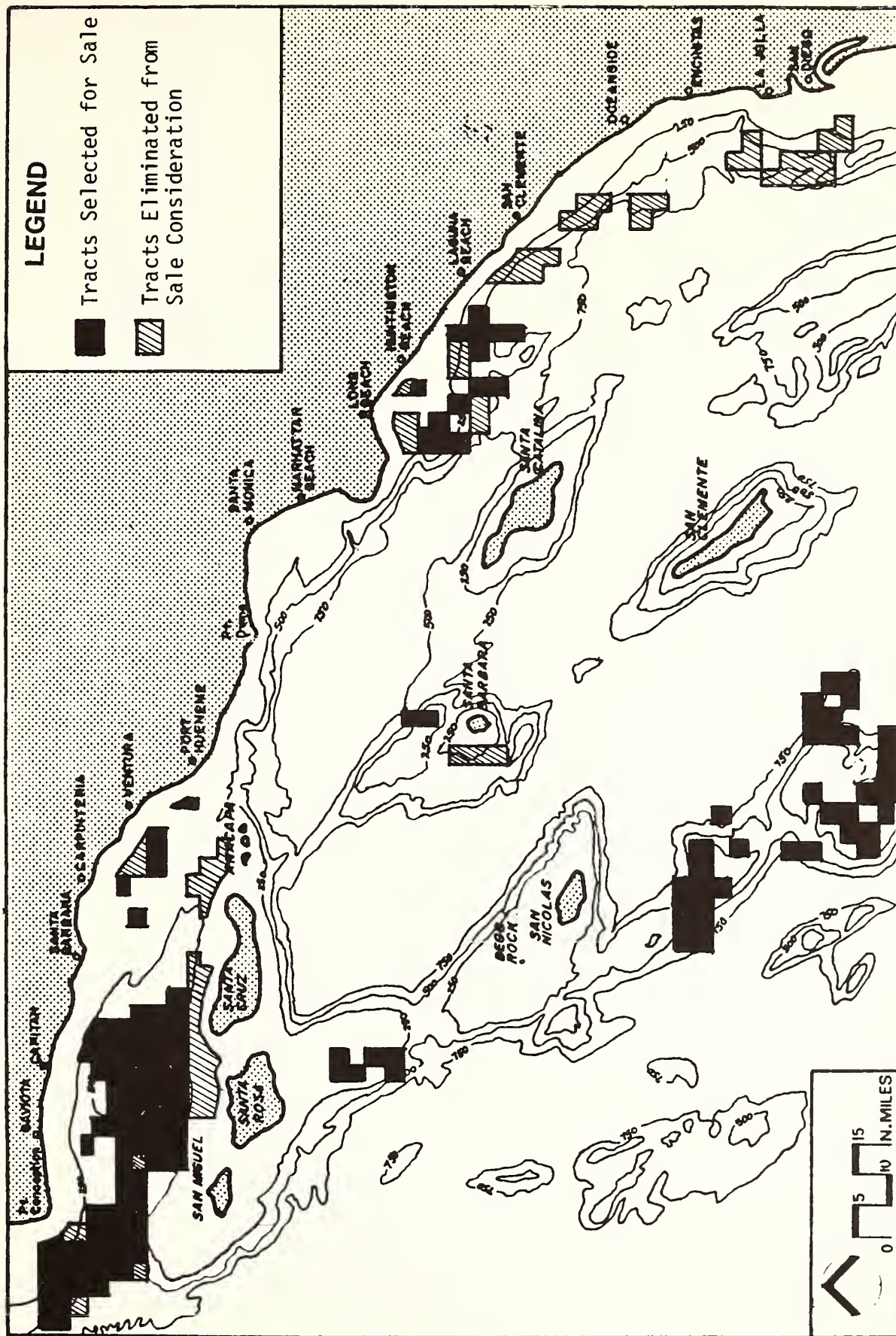


FIGURE E-17. Tracts withdrawn from OCS Sale #48 by the Secretary of Interior. (Also see Figures E-18 and E-19 for withdrawn tracts in the vicinity of the northern Channel Islands.) Source: U. S. Department of Interior, 1979a.

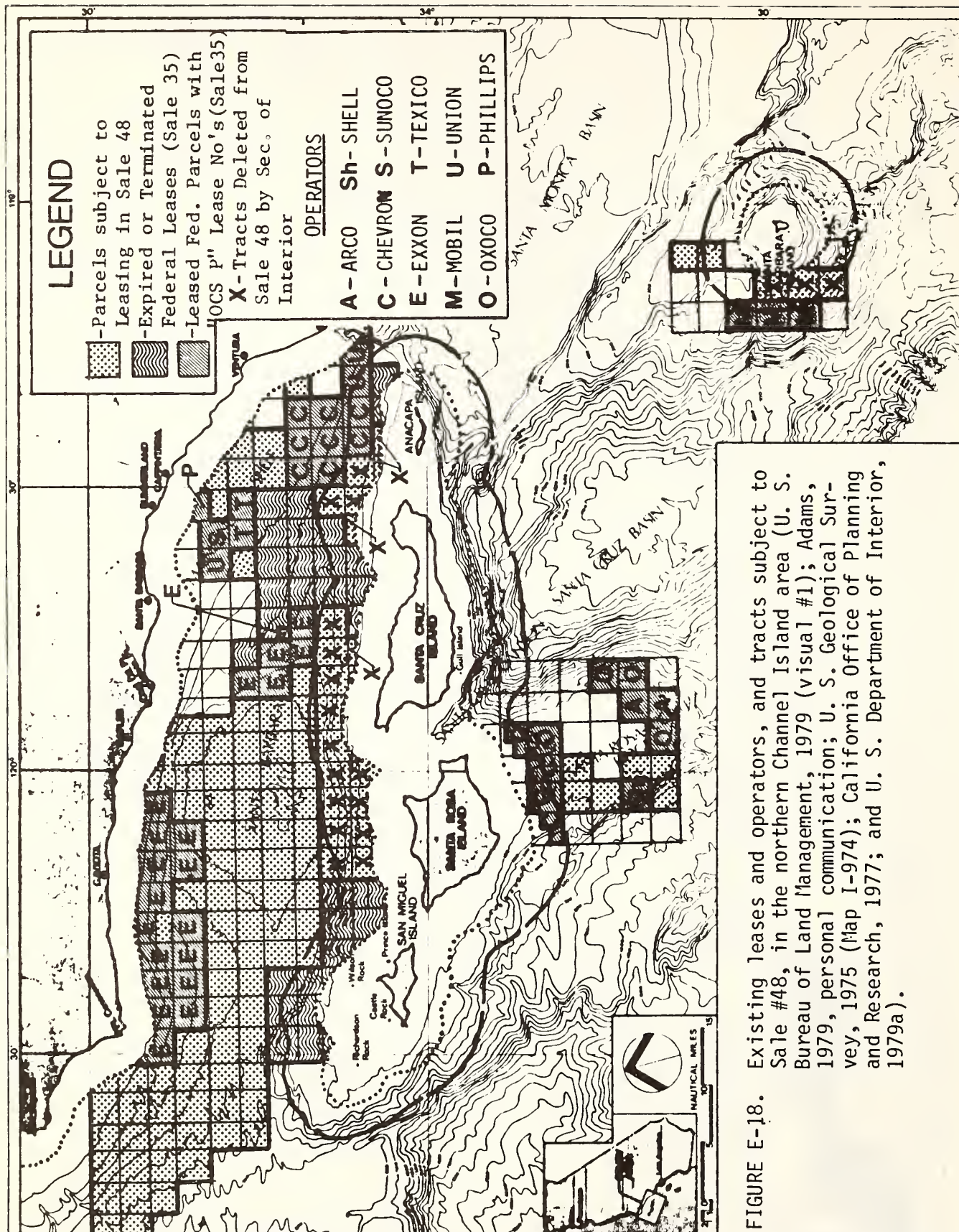


FIGURE E-18. Existing leases and operators, and tracts subject to Sale #48, in the northern Channel Island area (U. S. Bureau of Land Management, 1979 (visual #1); Adams, 1979, personal communication; U. S. Geological Survey, 1975 (Map I-974); California Office of Planning and Research, 1977; and U. S. Department of Interior, 1979a).

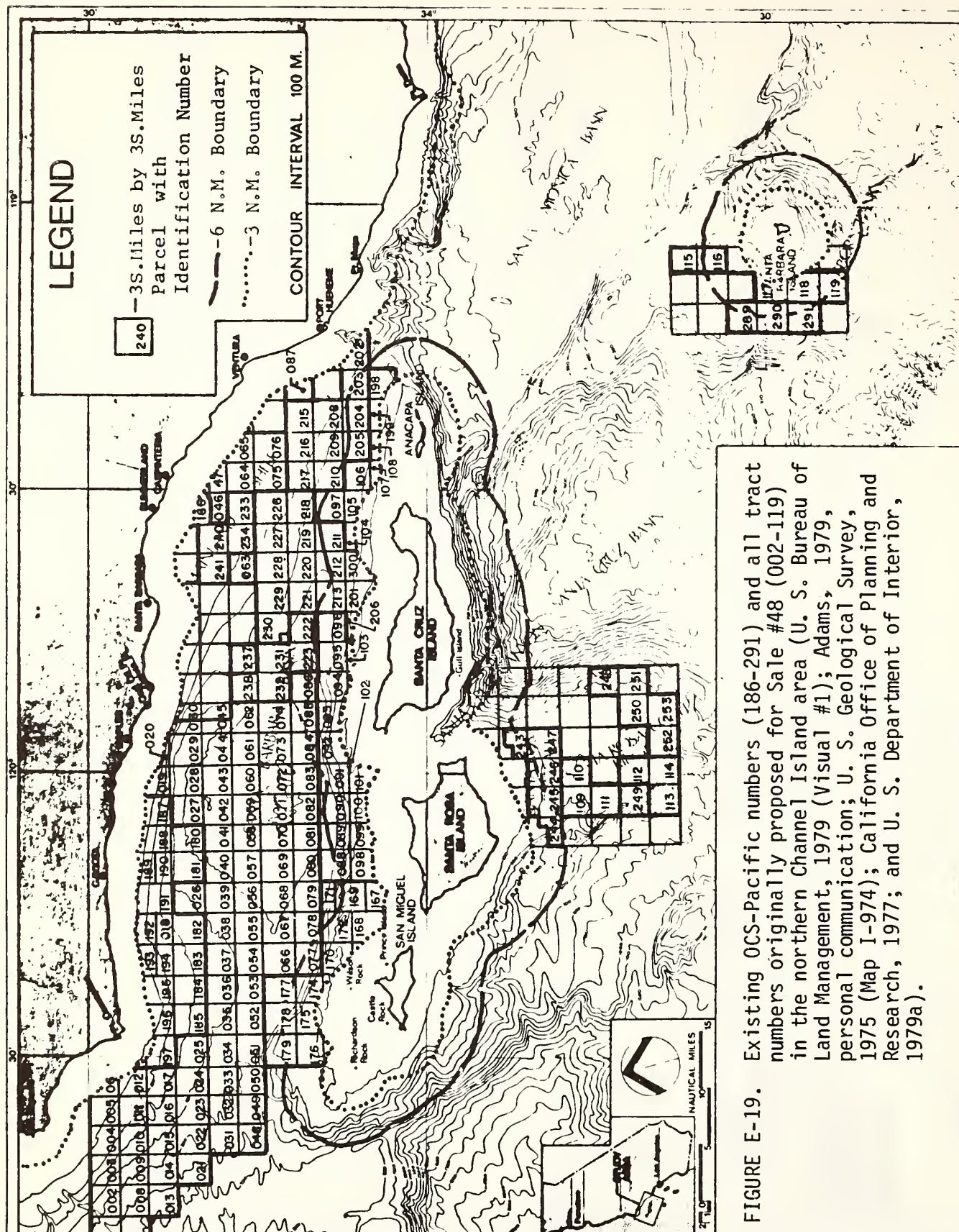


FIGURE E-19. Existing OCS-Pacific numbers (186-291) and all tract numbers originally proposed for Sale #48 (002-119) in the northern Channel Island area (U. S. Bureau of Land Management, 1979 (Visual #1); Adams, 1979, personal communication; U. S. Geological Survey, 1975 (Map I-974); California Office of Planning and Research, 1977; and U. S. Department of Interior, 1979a).

Table E-15. Platforms in the Santa Barbara Channel area (U. S. Bureau of Land Management, 1979 (Visual No. 1); U. S. Geological Survey, 1975 (Map I-974); Resources 1978; Adams, 1979, personal communication; and California Office of Planning and Research, 1977).

PLATFORM NAME	UNIT	TRACT	OPERATOR
<u>State Waters</u>			
Hope	Carpinteria	PRC-3150	Chevron
Hazel	Summerland	PRC-1824	Chevron
Heidi	Carpinteria	PRC-3150	Chevron
Hilda	Summerland	PRC-1824	Chevron
Holly	South Ellwood	PRC-3242	Arco
Helen	Cuarta	PRC-2206	Texaco
Herman	Conception	PRC-2725	Texaco
Rincon (Artificial Island)		PRC-1466	Arco
<u>Federal Waters</u>			
Union A	Dos Cuadras	P-0241	Union
Union B	Dos Cuadras	P-0241	Union
Union C	Dos Cuadras	P-0241	Union
Hillhouse	Dos Cuadras	P-0240	Sun
Henry (Planned)	Carpinteria	P-0204	Sun
Houchin	Carpinteria	P-0166	Phillips
Hogan	Carpinteria	P-0166	Phillips
Grace (Planned)	Santa Clara	P-0217	Chevron
Hondo	Santa Ynez	P-0188	Exxon
Gina (Planned)	Hueneme	P-0202	Union

TABLE E-16. Number of wells drilled on existing leases, all or partially within 6 nmi (11.1km) of the northern Channel Islands and Santa Barbara Island (also see Figure E-22). (Adams, 1979, personal communication; U.S. Bureau of Land Management, 1979 (Visual No. 1); U.S. Bureau of Land Management, 1978a).

Tract	Closest Island	Number of Wells	Operator	Future Status
167	San Miguel	1	—	Expired or Terminated
168	San Miguel	0	—	Expired or Terminated
169	San Miguel	1	—	Expired or Terminated
170	San Miguel	1	—	Expired or Terminated
172	San Miguel	0	—	Expired or Terminated
174	San Miguel	0	—	Expired or Terminated
175	San Miguel	0	—	Expired or Terminated
176	San Miguel	2	—	Expired or Terminated
177	San Miguel	0	—	Expired or Terminated
178	San Miguel	0	—	Expired or Terminated
179	San Miguel	1	—	Expired or Terminated
243	Santa Rosa	0	Oxoco	?
244	Santa Rosa	0	Chevron	?
245	Santa Rosa	0	Chevron	?
246	Santa Rosa	0	Chevron	?
247	Santa Rosa	0	Oxoco	?
200	Santa Cruz	0	—	Expired or Terminated
201	Santa Cruz	0	—	Expired or Terminated
206	Santa Cruz	0	—	Expired or Terminated
210	Santa Cruz	0	Chevron	?
211	Santa Cruz	0	—	Expired or Terminated
212	Santa Cruz	1	—	Expired or Terminated
213	Santa Cruz	0	—	Expired or Terminated
198	Anacapa	0	—	Expired or Terminated
199	Anacapa	2	—	Expired or Terminated
202	Anacapa	4	Union	Development
203	Anacapa	4	Unión	Exploratory Drilling
204	Anacapa	1*	Chevron	Exploratory Drilling
205	Anacapa	2	Chevron	Exploratory Drilling
208	Anacapa	1*	Chevron	Exploratory Drilling
209	Anacapa	1*	Chevron	Exploratory Drilling
215	Anacapa	1*	Chevron	Exploratory Drilling
289	Santa Barbara	1	Mobil	?
290	Santa Barbara	0	Mobil	?
291	Santa Barbara	0	Mobil	?

* Chevron's exploration plan for exploratory wells P-0204-1, P-0208-2, P-0209-2 and P-0215-2 was recently approved by USGS. The plan was certified as consistent with California's coastal plan by the California Coastal Commission on December 12, 1978.

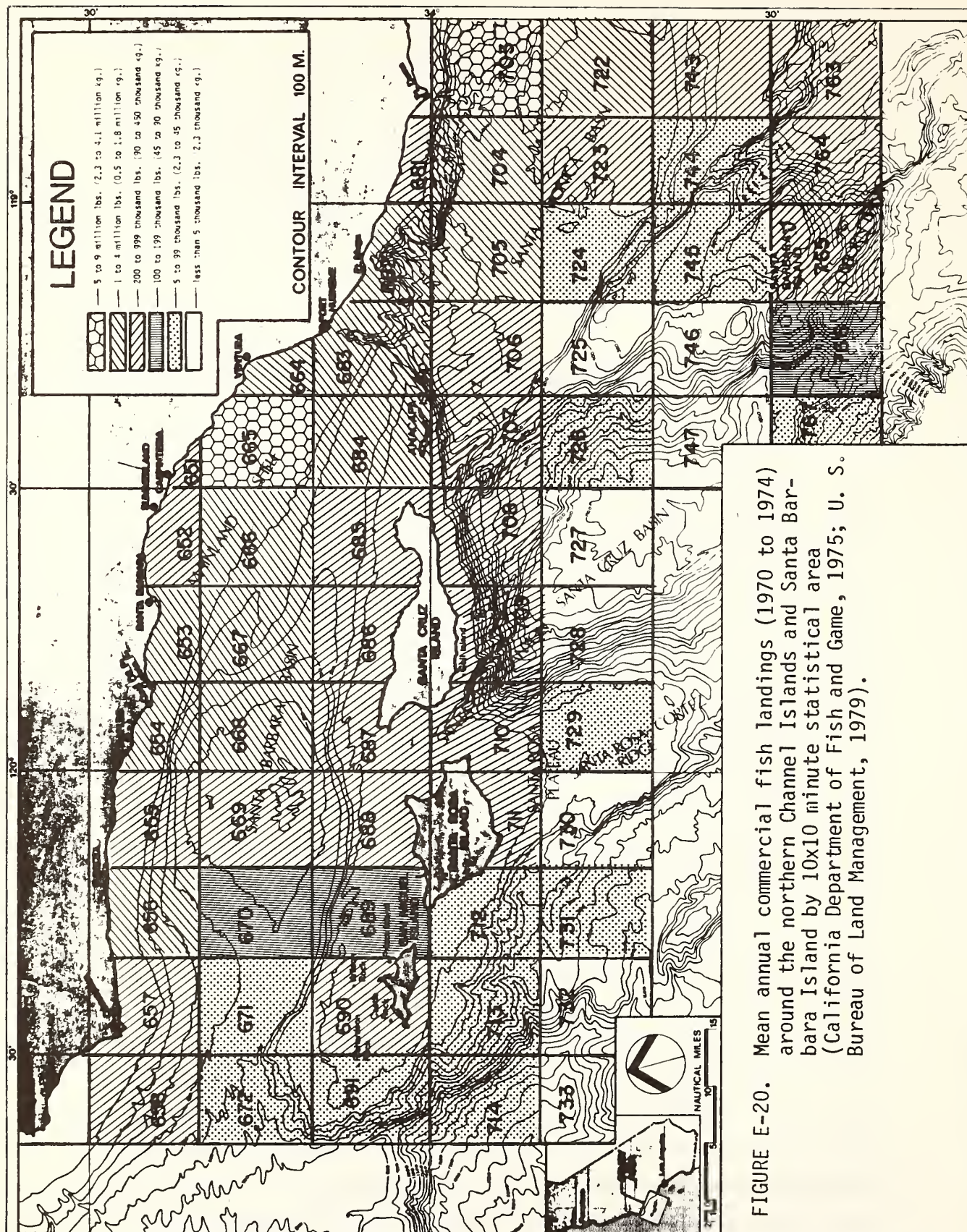
? As yet undetermined

drill up to 15 exploratory wells from tracts 222, 223, 230, 231, - 232, and 238 in the Santa Rosa Unit to be consistent with the coastal plan (California Coastal Commission, 1979). The southern tip of tracts 222 and 223 are approximately 6 nmi (11.1km) from Santa Cruz Island.

E.3.c. Commercial and Recreational Fishing and Plant Harvesting

Harvesting of living marine resources (see also Section E.2.c.) by commercial and recreational fishermen and kelp harvesters currently represents the most intensive human use occurring over the shelves adjacent to the northern Channel Islands and Santa Barbara Island. Depending on the species sought, commercial fishermen use gill nets, purse seines, traps, trawls, and other assorted gear while recreational fishermen typically use their hands, hook and line or sometimes spear guns. Commercial fishermen may seek any of a large variety of species which are of little interest to recreational fishermen. However, commercial and recreational fishermen may compete with each other for a few species such as rockfish and abalone.

Catch statistics maintained by the California Department of Fish and Game (DFG) indicate that for the study area, the greatest commercial fishing catch by weight occurs north of Anacapa Island in the Santa Barbara Channel (see Figure E-20). The tonnage of fish taken from these waters is typical of nearshore southern California coastal waters. The weights are well below the most productive commercial fishing area in the Bight off San Pedro, California; however, due to the extensive shallow water island



shelf areas, the island waters are major southern California producers of species such as abalone, sea urchin, rockfish, and kelp.

In addition to the fish and shellfish fisheries, the northern Channel Island waters and those off Santa Barbara Island support southern California's most productive kelp harvests. In 1978, the kelp beds around the northern Channel Islands produced over 24,000 wet tons (22,000 metric tons) of kelp while the beds around Santa Barbara Island produced 1,867 wet tons (1,600 metric tons) (California Department of Fish and Game, 1979). Kelp is harvested by specially designed ships, kelp cutters, which cut off and scoop up the top 4 ft. (1.3m) (depth of cut is limited by law) of the kelp while leaving the remainder of the plant alive and intact. Rapid growth of up to a foot or more per day under extremely favorable conditions permits several annual kelp harvests (California Department of Fish and Game, 1971; North and Hubs, 1968).

Kelp harvesting has occurred for almost 30 years around the northern Channel Islands although harvesting around Santa Barbara Island has only been started recently (Trabert, 1979, personal communication). The industry uses almost all of the well-developed kelp bed areas. Table E-19 illustrates fluctuations in landings between 1971 and 1975.

One of the major kelp harvesters, Kelco, uses small, single engine aircraft to survey the condition and size of kelp canopy so that kelp harvests can be scheduled after optimum regrowth of kelp vegetation. These craft operate at altitudes of approximately 500 ft. (152m) and move to within a quarter nmi (0.5km) of the Channel Islands (Trabert, 1979, personal communication).

The species and total catch of fish landed by commercial fishermen may vary significantly from year to year (see Table E-17). For example, between 1971 and 1975, annual sea urchin harvests rapidly expanded from zero to several million pounds as this new regional fishery developed. Conversely, lobster catches declined steadily over the same period. Comparable trends in the landings of other species such as abalone and rockfish are less clear. Table E-18 lists the species caught most abundantly around the northern Channel Islands and Santa Barbara Island during 1975 (the most recent year for which comprehensive statistics were compiled). Among the species taken from the area in the greatest amounts were the jack mackerel, northern anchovy, market squid, bocaccio, sea urchin, abalone, and rockfish, the latter three being mainly limited to the island shelves.

Although commercial fishing occurs throughout the year around the northern Channel Islands and Santa Barbara Island, individual fisheries may vary seasonally. For example, 1975 DFG data show that squid were taken most frequently in spring while the northern anchovy was fished primarily during the fall and winter. Sea urchin, rockfish, and abalone* were taken throughout the entire year. Compared to the northern Channel Islands, fisheries around Santa Barbara Island were generally less productive and dominated more by open water pelagic fish species.

Commercial abalone divers, through the Abalone Association and the Abalone Seeding Association, sponsor an abalone mariculture hatchery in Santa Barbara. Abalones are cultivated for future restocking; the seeding association has a monthly planting at San Miguel Island, near Cuyler Harbor (Pirog, 1979, personal communi-

*The commercial taking of abalone is prohibited during the months of February and August.

TABLE E-17. Commercial fish landings for selected species caught off the northern Channel Islands and Santa Barbara Island between 1971 and 1975 (developed from California Department of Fish and Game, 1979).

Species	Weight in 1000 lbs.									
	1971		1972		1973		1974		1975	
	Channel Islands	Santa Barbara	Channel Islands	Santa Barbara	Channel Islands	Santa Barbara	Channel Islands	Santa Barbara	Channel Islands	Santa Barbara
Abalone:										
Black	56.5	0.9	780.3	6.4	1251.3	18.1	718.4	15.7	454.1	48.7
Red	488.5	44.6	386.3	87.9	297.7	39.2	268.9	95.4	250.7	124.6
Green	3.6	0.9	1.5	1.3	2.1	0.1	2.5	--	1.7	0.2
Pink	102.8	6.0	97.1	21.1	118.5	2.9	140.1	19.1	124.6	31.1
All Others	0.2	--	0.1	--	0.7	--	0.8	0.1	1.1	0.2
Sea Urchins	--	--	--	--	911.8	--	1679.6	--	2604.3	--
Lobster	23.9	2.5	32.6	15.7	19.2	7.9	12.4	9.8	10.7	--
Pacific Bonita	314	22	346	34	760	20	60	101	--	--
Jack Mackerel	274	1110	50	732	26	130	146	1138	344	66
Northern Anchovy	--	148	2200	--	2804	436	2150	50	1302	6
Market Squid	434	--	22	--	530	82	1844	44	2170	--
Rockfish	126	--	244	--	340	--	180	--	214	--
Swordfish	--	16	--	4	--	12	--	20	--	30
All Other finfish	944	40	1602	74	3044	20	3120	54	4370	66
TOTAL	2771	1390	5762	976	10,105	768	10,327	1548	11,839	409

Table E-18. 1975 commercial fish landings by species (in 10 x 10 minute blocks) around the northern Channel Islands and Santa Barbara Island. Note: Block numbers refer to numbered areas shown on Figure E-24. Only species with landings in excess of 10,000 lbs. (4,500kg) are listed. (Based on statistics from the California Department of Fish and Game.)

<u>Island/ Block</u>	<u>Species</u>	<u>Weight (in lbs.)</u>	<u>Month of Greatest Catch</u>
ANACAPA ISLAND			
684	Northern anchovy	5,932,650	Dec.
	Sea urchin	209,624	Jan.
	Bluefin Tuna	198,850	Aug.
	Bocaccio	168,969	Oct.
	Rockfish	147,045	May
	English sole	81,765	Mar.
	Petrale sole	16,490	Sep.
	California halibut	11,284	Jul.
	Sablefish	10,321	Oct.
	20 other species	24,272	---
	Total for Block	6,801,270	
707	Sea urchin	406,704	Jun.
	Northern anchovy	194,300	Oct.
	Swordfish	20,733	Aug.
	3 other species	4,207	---
	Total for Block	625,944	
SANTA CRUZ ISLAND			
685	Market squid	1,080,648	May
	Northern anchovy	718,600	Jan.
	Jack mackerel	123,500	Sep.
	Sea urchin	67,513	May
	Rockfish	22,585	Jun.
	18 other species	41,997	---
	Total for Block	2,054,843	
686	Sea urchin	372,605	Dec.
	Market squid	356,200	May
	Bocaccio	32,742	Dec.
	21 other species	32,871	---
	Total for Block	794,418	

Table E-18 Cont.

687	Market squid	936,525	May
	Sea urchin	78,639	Jan.
	Pink abalone	10,542	Oct.
	18 other species	28,799	---
	Total for Block	<u>1,054,505</u>	
708	Sea urchin	134,265	Dec.
	Pink abalone	40,808	Oct.
	Red abalone	26,732	Mar.
	Swordfish	26,603	Sep.
	Black abalone	10,452	Oct.
	10 other species	4,977	---
	Total for Block	<u>243,837</u>	
709	Sea urchin	224,206	May
	Jack mackerel	173,455	Sep.
	Bluefin tuna	96,035	Jul.
	Market squid	71,829	Jun.
	Pink abalone	46,181	Apr.
	Red abalone	25,318	Jul.
	Swordfish	18,620	Aug.
	13 other species	13,722	---
	Total for Block	<u>669,366</u>	
SAN MIGUEL ISLAND			
690	Black abalone	319,959	Jul.
	Sea urchin	225,423	Jan.
	Red abalone	116,336	Jan.
	Rockfish	71,576	Nov.
	Yelloweye rockfish	47,520	May
	Bocaccio	31,713	Nov.
	26 other species	56,336	---
	Total for Block	<u>868,863</u>	
713	Jack mackerel	48,000	Jan.
	7 other species	12,571	---
	Total for Block	<u>60,571</u>	
SANTA ROSA ISLAND			
688	Northern anchovy	584,300	Oct.
	Spot prawn	23,713	Jul.
	Rockfish	16,194	Apr.
	Market squid	14,844	Jun.
	16 other species	36,481	---
	Total for Block	<u>675,532</u>	

Table E-18 Cont.

711	Sea urchin	970,038	Apr.
	Black abalone	62,119	Sep.
	Bluefin tuna	57,391	Jan.
	Rockfish	49,595	Jul.
	Red abalone	35,305	Jun.
	13 other species	30,506	---
	Total for Block	<u>1,204,954</u>	
712	No species over 10,000 lbs.		
	12 species reported	31,037	---
SANTA BARBARA ISLAND			
744	Swordfish	11,832	Nov.
	3 other species	11,852	---
	Total for Block	<u>23,684</u>	
745	Swordfish	2,386	Jul.
	No other species reported		---
764	Jack mackerel	66,500	Nov.
	Bluefin tuna	22,165	Aug.
	4 other species	3,422	---
	Total for Block	<u>92,087</u>	
765	Swordfish	13,739	Oct.
	Rockfish	12,599	Jul.
	8 other species	20,841	---
	Total for Block	<u>47,179</u>	

cation).

Recreational fishing is a major use of the fish resources around the northern Channel Islands and Santa Barbara Island. Although some fishermen seek tuna, albacore, marlin, or swordfish in the deeper waters seaward of the island's slope, most recreational fishermen, particularly those on commercial partyboats, are attracted to the nearshore island shelf waters, especially the areas over kelp beds. According to partyboat fishing statistics compiled by the California Department of Fish and Game (1979), rockfish, kelp, and sand bass are the species caught in greatest abundance, supplemented by regular takings of a variety of other species (see Tables E-20 and 21, and Figure E-21). Sportdivers collect lobster, abalone, and other invertebrates.

Recreational fishermen visit offshore waters either as passengers on commercial partyboats or on private pleasure craft. Waters toward the center of the northern Channel Islands chain, primarily off Santa Cruz and Santa Rosa Islands, are most heavily frequented by partyboats (see Figure E-22). Although statistics on the concentrations of private fishing boats are not available, most private boats probably fish the north side of Anacapa and Santa Cruz Islands (Ono, 1979, personal communication).

Most visitors to northern Channel Island waters leave from harbors on the mainland side of the Santa Barbara Channel, including Oxnard, Ventura, Port Hueneme, Santa Barbara, and Gaviota, some 14 to 42 nmi (25 to 75km) from the northern Channel Island waters. Visitors to Santa Barbara Island waters come primarily from more southerly ports in the Los Angeles area or from Santa Catalina Island. Based on California Department of Fish and Game partyboat statistics for 1975, most recreational anglers fish during the

TABLE E-19. Kelp harvests off the northern Channel Islands and Santa Barbara Island between 1974 and 1978 (California Department of Fish and Game, 1979).

Area	(Weight in Wet Tons)				
	1974	1975	1976	1977	1978
Northern Channel Islands (San Miguel, Santa Rosa Santa Cruz, Anacapa, and Santa Barbara Islands)	19,858	11,538	5,535	15,304 ¹	24,588
Santa Barbara Island	--	--	--	--	1,867
Total	19,858	11,538	5,535	15,304	26,455

TABLE E-20. Commercial passenger fishing vessel catch in number of fish for the northern Channel Islands between 1970 and 1974 (California Department of Fish and Game, 1979).

Species	1970	1971	1972	1973	1974
Rockfish	337,820	215,906	358,641	436,486	303,425
Kelp and Sand bass	67,061	109,679	84,875	74,352	58,925
Halfmoon	319	93,305	32,782	34,012	3,613
California Sheephead	7,474	9,755	9,626	14,369	7,051
Ocean Whitefish	5,972	4,933	7,373	7,171	4,092
Lingcod	5,387	4,569	5,940	6,248	5,872
Cabezon	1,217	1,754	1,526	1,037	490
Bonito	11,529	40	3,539	5,543	582
Flatfish, misc.	1,132	488	976	1,816	737
California halibut	1,622	643	859	1,228	303
All Others	2,220	5,856	5,071	3,048	4,408
Total	441,743	466,928	511,208	585,310	389,498

TABLE E-21. Commercial passenger fishing vessel catch in number of fish for Santa Barbara Island between 1970 and 1974 (California Department of Fish and Game, 1979).

Species	1970	1971	1972	1973	1974
Rockfish	65,674	39,809	48,729	68,858	66,026
Kelp and Sand bass	2,614	191	10,774	6,098	250
Ocean Whitefish	2,408	1,431	729	1,890	358
Halfmoon	939	27	1,374	3,352	50
Sheephead	1,657	593	2,417	2,239	309
Flatfish, misc.*	317	185	91	1,275	354
Bonito	1,704	0	27	64	40
Sculpin	102	178	243	19	113
Lingcod	93	75	79	122	66
Cabezon	16	12	87	66	10
All Others	291	6	343	1,506 ⁺	35
Total	75,815	42,505	64,893	85,489	67,611

* includes halibut

⁺ predominately Pacific mackerel

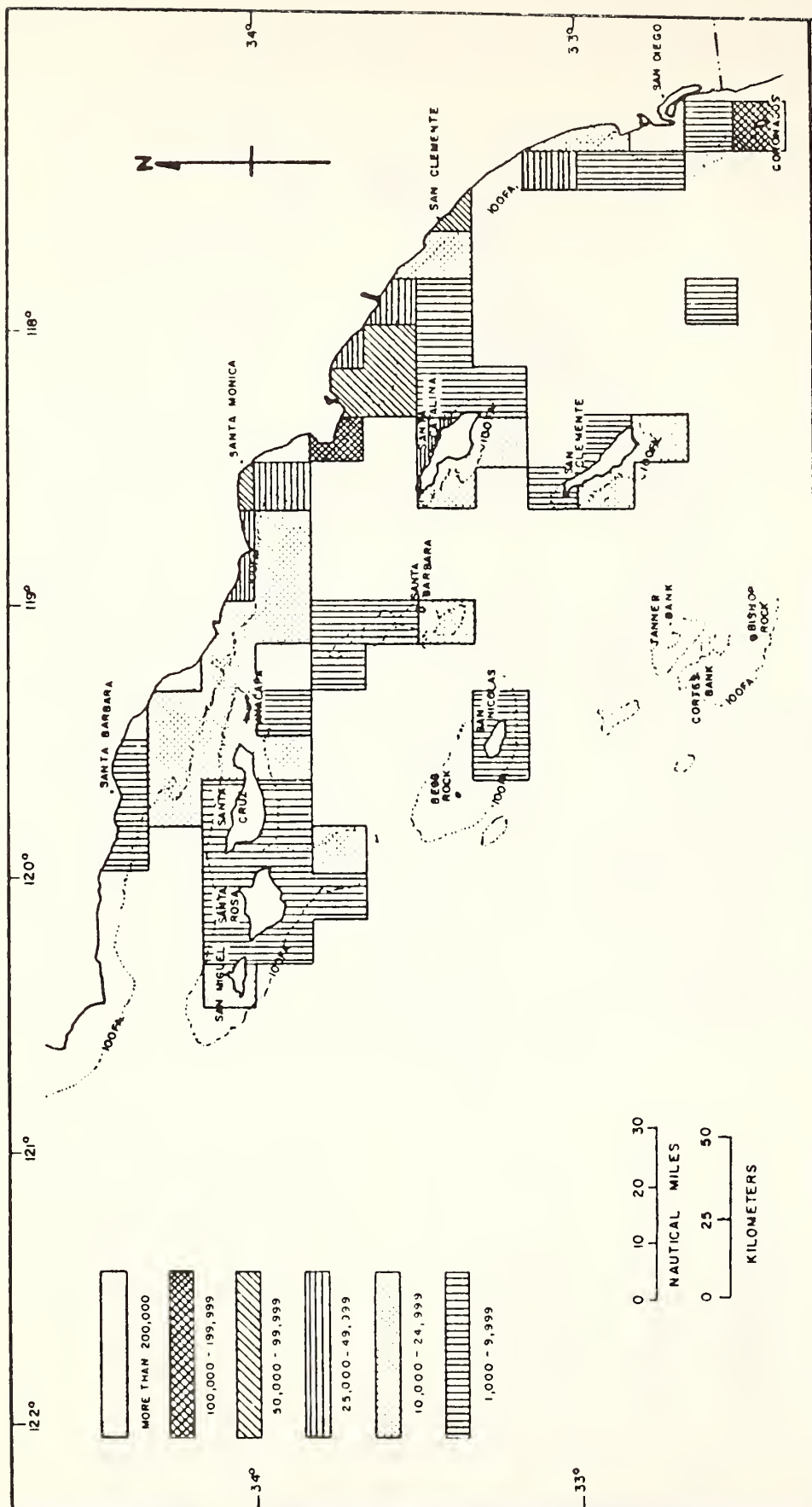


FIGURE E-22. Cumulative density of anglers fishing from partyboats in the southern California partyboat fleet (California Department of Fish and Game Marine Sport Catch Studies as presented in U. S. Bureau of Land Management, 1979).

warmer months of June through September, but year-round activities persist at a lower use level.

E.3.d. Commercial Shipping

Due to the study area's location near a major shipping route and the presence of active oil and gas leases, commercial vessels regularly navigate the Santa Barbara Channel region. Furthermore, numerous proposed projects, some of which are imminent, will add to the overall level of shipping.

A Traffic Separation Scheme (TSS) established by the Coast Guard runs just north of, and roughly parallel to, the northern Channel Islands. It approaches to within 2 nmi (3.7km) of Anacapa in the east end of the Channel and is about 20 nmi (35km) from San Miguel Island in the west end of the Channel (Figure E-23). The TSS is used by many commercial vessels travelling between northern Pacific ports (e.g., Alaska, San Francisco, and Seattle) and those situated in southern California, as well as by traffic using the Panama Canal or heading to and from Indonesia and other western Pacific ports. Large vessel traffic (i.e., vessels larger than 100 gross tons) has been estimated to pass through the Channel at a rate of 6.5 vessels per day in a northbound direction and 5.5 vessels per day in southbound direction (McMullen, 1977).

Another Channel area survey, conducted by the Coast Guard at Port Hueneme and assisted by radar data collection procedures, reported a daily average traffic load of nine large vessels (300 feet or longer) heading north within, or closely paralleling the TSS (Cherney et al., 1978). This study also recorded a daily combined average of seven medium (100-299 feet long), small (less than 100

feet long), and tug-in-tow vessels en route along the TSS in a northerly direction. In addition, an average daily load of 32 vessels (including vessels of all sizes) were observed crossing the lanes from one side of the Channel to the other. The majority of these were probably linked to service/supply boat activity between Port Hueneme and offshore oil and gas platforms and associated facilities.

The most common cargo aboard ships transitting the study area appears to be petroleum products, both crude and refined. In 1976, these products accounted for approximately two-thirds (66 percent) of the total cargo (by weight) received at or shipped from Long Beach Harbor, Los Angeles Harbor, and Port Hueneme -- the three major ports closest to the study area (U. S. Army Corps of Engineers, 1976). In order of decreasing tonnage, the predominant petroleum products handled at these ports were crude petroleum, residual fuel oil, and distillate fuel. Commodities such as fresh fruits and nuts, limestone, basic chemicals, coke, iron, steel, nonmetallic minerals, and lumber made up much of the remaining non petroleum related cargo passing through these ports.

Although precise traffic log counts are not kept, it is reported that the majority of vessels passing within or close to the study area are of foreign registry (Bannon, 1979, personal communication).

The waters around the northern Channel Islands are also used by ships servicing offshore oil and gas lease tracts in the immediate Channel region. Because there is currently limited onshore pipeline capacity from the Channel area to Los Angeles Basin refineries, most offshore production must be transported either by tanker or barge or both.

In the future, vessel traffic in the Channel is likely to increase both as a result of new southern California offshore oil production and the realization of a number of external projects now in the planning stages. As many as 40 new round trips per month can be expected as a result of offshore Santa Barbara Channel oil production if platform-to-shore pipelines are not constructed (California Office of Planning and Research, 1977). Specifically, this increase would consist of new production from the South Ellwood, Summerland, and Carpinteria State offshore fields, and the Santa Ynez, Santa Clara, and Hueneme Units. However, the recent approval of an oil and gas pipeline system by the South Central Coast Regional Commission should significantly lower the number of projected tanker and barge vessels transitting the Channel (California Coastal Commission, 1979b). Tanker traffic can still be expected to increase as a result of exploration and development of other OCS Sales #35 and #48 leases.

Projects not originating in the Santa Barbara area also may lead to increased vessel traffic in the Channel.

However, there is a possibility that current levels of vessel traffic in the Santa Barbara Channel due to the transport of Alaskan oil will decrease. Congressman Lagomarsino (R., Calif.) has introduced a bill in the House of Representatives which would prohibit vessels transporting Alaskan oil from using routes through waters lying shoreward of the Channel Islands (HR 1056, 96th Congr. 1st Sess., 1979). This legislation is currently pending before the Coast Guard subcommittee of the House Merchant Marine and Fisheries Committee. Tankers carrying Alaskan crude now pass through the Channel at a rate of about 183 per year (Stark, 1979, personal communication).

A project which might increase Santa Barbara Channel tanker traffic involves shipment of Naval Petroleum Reserve oil. Pursuant to the Naval Petroleum Reserves Production Act of 1976, facilities will be acquired or constructed to ship not less than 350,000 barrels per day of crude oil from Elk Hills, California to unspecified marketing terminals.

One transportation option being considered would involve piping this oil to Port Hueneme and then transferring it by tanker to market. Tankers bound for Pacific coast destinations north of Port Hueneme such as San Francisco would have to enter the Channel shipping lanes. If this option were put into operations, an estimated 207 additional northbound vessel trips per year could be expected through the Channel (U. S. Bureau of Land Mangement, 1979).

Another proposed project which might add to the present level of commercial shipping in the Santa Barbara Channel is the construction of a liquified natural gas (LNG) terminal and gasification plant in southern California. To date, a variety of sites have been proposed and considered by the California Coastal Commission (CCC), the California Public Utilities Commission (PUC), and the Federal Energy Regulatory Commission (FERC). A final decision has not as yet been made. The site at Point Conception, preliminarily approved by the PUC, would result in little if any additional traffic in the study area -- LNG tankers would approach no closer than 20 nmi (37km) from San Miguel Island. A site further south at Oxnard, which is currently favored by FERC (which has permitting authority along with PUC) would result in a steady flow of tankers through the Channel. The CCC has suggested alternative offshore siting options near the northern Channel Islands; how-

ever, neither the PUC, FERC, nor the applicant have seriously considered them (Reese, 1979, personal communication).

Finally, the Space Shuttle Vehicle System at Vandenberg Air Force Base, when in operation, will also lead to increased vessel traffic. Barges transporting expendable external tanks will be moved from Port Hueneme through the Channel to Vandenberg. Ten round trips per year by barge are expected (U. S. Bureau of Land Management, 1979). Also, boosters recovered after launch in an impact zone southwest of Point Arguello are likely to be towed across the Channel, thus adding to the region's traffic.

E.3.e. Military Operations

The United States Navy and Air Force conduct a wide range of military operations in the general southern California Bight area. All of these operations are strictly controlled whether on sea or in the air, and all require that extensive danger zones be free of non-participants in order that the conduct of an operation may safely proceed. Current operations include air to air, air to surface, surface to air, and surface to surface missile launch, bomb drop exercises (inert bombs with spotting charges), aerial mining exercises, and some submarine activities in the hydrophone array area south of Santa Cruz Island. Additional military operations planned for the near future are those in conjunction with the Air Force Space Shuttle Vehicle Flight System. The Navy maintains a weather station on San Miguel Island. No permanent personnel stay on the island in connection with the station, but occasionally personnel visit the station by helicopter to check equipment.

Bomb drop exercises in the area at San Miguel Island are conducted against a target buoy in ocean waters approximately 1 nmi (1.8km) south of the eastern tip of the island. Light attack aircraft from the Naval Air Station, Lemoore, California are the primary users of this facility. The present rate of these operations is approximately 200 times a year, with an average of five aircraft per flight--a total of 1,000 individual sorties per year. Planes making the bombing runs cruise at an altitude of 12,000 ft (3063m) and descend to an altitude of approximately 2,000 ft (606m) when dropping practice bombs. A surface danger zone extends 3 nmi (5.6km) from the shoreline of the eastern half of San Miguel Island. Prior to the conduct of bomb drop exercises, boaters are advised to remain clear of this area (U.S. Department of Navy, 1979, personal communication).

San Miguel Island has not been intentionally struck by ordnance items for many years. Occassionally, however, missile danger zones may overlie the island, forcing evacuation of personnel for the duration of such activities.

A practice aerial mine range is maintained by the Navy in Beecher's Bay on the northeast side of Santa Rosa Island and in the channel area between Santa Rosa and Santa Cruz Islands. The mines used are inert and consist of a mine casing filled with sand and concrete. The altitude of aircraft involved in mine laying operations is often as low as 200 ft (61m). Mine recovery by divers occurs approximately once each month. This activity requires the presence of recovery craft for a period of approximately three days.

The Navy maintains an undersea hydrophone array extending south from the east end of Santa Cruz Island for a distance of approximately 10 nmi (18.5km). The facility is operated by the General Motors Corporation, Delco Division, and is used for acoustic measurement purposes approximately 50 times a year (Scruggs, 1979, personal communication).

As noted, a future Air Force use of the area involves the development and operation of the Space Shuttle Vehicle System. Approximately 20 operation flights are planned for the system and will be launched for Vandenberg Air Force Base on Point Conception (beginning in December, 1982, and extending over an 8-year period), although only seven or eight polar orbit flights will pass directly over the Island shortly after takeoff. Flight profiles indicate that the launch vehicle would be between 160,000 and 180,000 feet (48,480 to 54,500m) as it passes over the study area (Pfeiffer, 1979, personal communication). Overpressures felt on the islands will vary widely, however, depending on the angle of inclination chosen upon launching.

As part of the space shuttle system a splashdown area to the west and southwest of San Miguel Island is planned for the recovery of space shuttle booster rockets. Most returning shuttles will approach the study area at altitudes ranging from 80,000 to 100,000 feet (24,200 to 30,300m) along a reentry path passing near, and for one return orbit directly over, San Miguel Island. Overpressures of variable intensity (1 1/2-2 pounds per square foot) are projected to resemble aircraft sonic booms in these cases (Pfeiffer, 1979, personal communication). The towing of spent booster rockets by barge from Port Hueneme to Vandenberg AFB is also envisioned and is addressed in Section E.3.d. above.

E.3.f. Research

Because of the exceptional abundance and condition of marine birds, marine mammals, fish and intertidal populations (see Section E-2), the marine ecosystem surrounding the northern Channel Islands and Santa Barbara Island provides an especially valuable natural laboratory for investigating species interactions with other marine life and with their environment. These natural attributes have encouraged extensive scientific oceanographic research by government and university groups. Many research institutions located throughout the southern California area have conducted (see Table E-22) or funded (see Table E-23) scientific investigations in the area.

E.3.g. Recreation

Water-based recreational activities in the northern Channel Islands and Santa Barbara Island region are pursued by three often interrelated user groups: pleasure boaters (sail and power); SCUBA divers and spearfishermen; and those interested in photography and nature study (e.g., marine bird and mammal observers). Although the dominant means of recreational access is by boat, charter aircraft overflights also provide a form of access which appears to be increasing in popularity (Coffin, 1979, personal communication). For a discussion of sport fishing see Section E.3.c.

The attractiveness of the northern Channel Islands as a destination for recreationists is generally on the upsurge; still there is currently no indication that congestion among recreational users is a problem. Natural controls upon public accessibility -- most notably lengthy boat travel distances from the mainland and

Table E-22 Major research organizations which have or are likely to conduct marine related scientific investigations on the coastal ocean environment in southern California

University of California at
Santa Cruz*
Irvine*
Berkeley*
San Diego*
Los Angeles*
Santa Barbara*

Scripps Institute (part of the University of California and San Diego)

Santa Barbara Museum of Natural History

California State Colleges (at Long Beach and Fullerton)

California Institute of Technology

Los Angeles County Museum

Planning Research Corporation

Point Reyes Bird Observatory

San Diego State College

University of Southern California*

Allan Hancock Foundation

Hubbs Seaworld in San Diego

California Department of Fish and Game

U.S. Bureau of Land Management

National Marine Fisheries Service

* Sea Grant Universities

TABLE E-23. Examples of research funding entities with potential or demonstrated relevance to the northern Channel Islands and Santa Barbara Island waters.

FEDERAL GOVERNMENT

1. Department of Interior

- a) U.S. Bureau of Land Management supports environmental baseline studies as well as special studies on hydrocarbon/heavy metal pollution; supported sea and air surveys of marine mammals and seabirds in the southern California Bight.
- b) U.S. Fish and Wildlife Service supports research on sea otters in southern California as well as migratory birds and endangered species.
- c) National Park Service supports research concerning living resources found within the Channel Island National Monument.

2. Department of Commerce

- a) National Marine Fisheries Service supports research concerning marine mammals (including seals and sea lions on San Miguel), fishery resources, and endangered marine species.
- b) Office of Sea Grant supports a full range of marine related research through its system of Sea Grant colleges.
- c) Office of Coastal Zone Management supports research and monitoring at marine sanctuaries as well as coastal management concerns
- d) Office of Environmental Data Service supports a full range of oceanographic and climatological data collection, analysis and archiving functions.

3. Environmental Protection Agency

supports studies and monitoring of pollutant levels in coastal and pelagic marine organisms and environments.

4. National Aeronautics and Space Administration

supports oceanographic research utilizing telemetric and remote sensing capabilities of aircraft and satellites.

5. Marine Mammal Commission

supports research pertaining to conservation and protection of marine mammals including abundance and distribution studies, ecological studies, and biological studies.

6. National Science Foundation

supports a variety of pure and applied marine science and engineering projects.

7. Department of Energy

supports research and monitoring of marine pollution levels in coastal and pelagic marine organisms and environments.

8. Department of Defense

- a) U.S. Air Force supporting research on the effects of the space shuttle's supersonic booms on marine mammal and seabird life in the northern Channel Islands.
- b) Office of Naval Research supports bioacoustic and biomedical research on marine mammals as well as other marine studies.
- c) Naval Undersea Center and Other Units supports bioacoustic research on marine mammals.

STATE GOVERNMENT

1. California Department of Fish and Game

supports research concerning state fisheries as game species maintains sport and commercial fishing statistics, conducts monitoring research.

2. California Coastal Commission

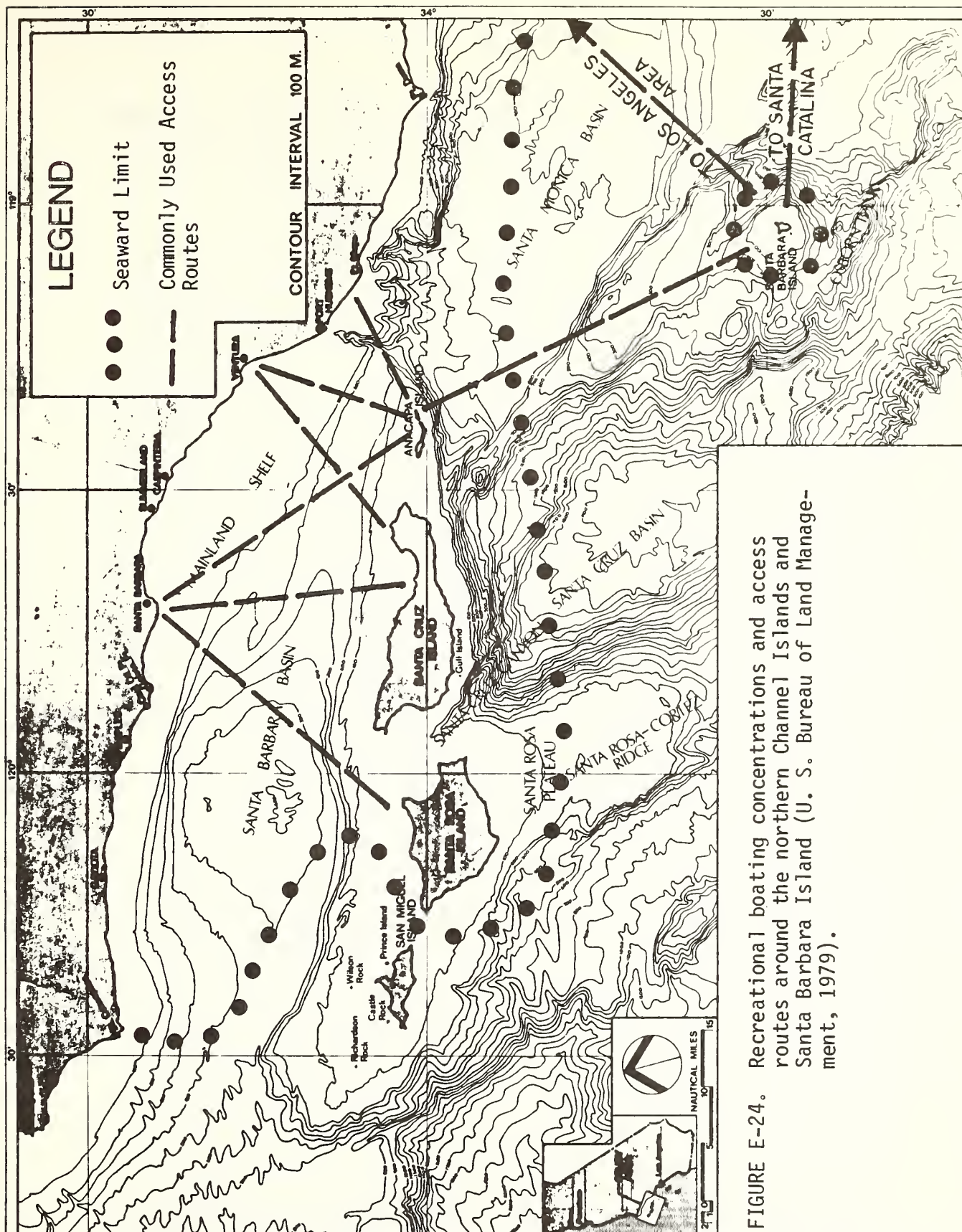
supports research related to coastal water resource and use management.

occasionally adverse weather conditions -- are matched by as yet fairly strict landing permit controls.

Together these controls favor rather sparse activity densities. This is not to say, however, that future recreational trends in southern California might not alter the activity patterns around the northern Channel Islands over the long run. Regional water-oriented leisure demands already appear to be exceeding supplies available along the mainland coast and Santa Catalina Island to the south (California Department of Parks and Recreation, 1979). Consequently, it is possible that the Islands will increasingly function as an "overflow" destination for the greater southern California region.

Another potential stimulant to the growth of water-based recreational activities is the rising popularity of the Channel Island National Monument (i.e., Santa Barbara and Anacapa Islands) for public visitations. The National Park Service's (NPS) current policy encourages tightly monitored visitations, while at the same time cautioning the public (in preventative fashion) against overuse.

Most private boaters frequenting waters surrounding the Channel Islands are either en route to activities on the islands or engaged in activities such as diving, fishing, or nature observation. A small percentage of users is comprised of "through" boating parties destined for other points along the California coast. Many of these transients often use passages separating Santa Cruz, Santa Rosa and Anacapa Islands (Figure E-24) (U. S. Bureau of Land Management, 1979). While extensive data on vessel types and seasonal use densities are unavailable, it also is probable that these parties occasionally



make island stopovers, if only to seek shelter within approved overnight mooring areas (e.g., San Miguel's Tyler Bight and Cuyler Harbor).

Although the National Park Service discourages private craft from travelling to the Channel Islands National Monument for the sole purpose of visiting, many recreationists do exactly this. En route, they often partake in nature observation and occasional diving. Yet another class of boaters travels to nearshore zones merely to enjoy the islands' scenery (from on board) or the exhilaration of a day's relaxation at sea. In the absence of detailed boater surveys, however, there is no way of differentiating between levels of private passive boaters, multi-activity boaters (i.e., divers/nature observers), and those solely concerned with reaching the monument islands for other land-based pursuits. The most popular staging points for private vessels with destinations on or around the northern Channel Islands are situated along the coast between Point Conception and Point Mugu. They include Santa Barbara, Ventura, Oxnard, Gaviota, Goleta, and Port Hueneme (U. S. Bureau of Land Management, 1979).

Whereas private recreational boaters are apt to cruise throughout the northern Channel Islands region and can partake of diving and/or nature watching in innumerable nearshore locales, the majority of visitors to the Channel Monument Islands of Anacapa and Santa Barbara arrive on commercial pay-as-you-go charters. For example, one publicly licensed common carrier operating out of Ventura to Anacapa (and a few other island destinations nearby) carries most of the total visitor traffic to the monument. Day-long, as well as overnight, camping drop-off/pick-up arrangements, are provided throughout the year, reaching their peak activity season (6 trips per day) between June and September (Duthie, 1979,

personal communication). Although aimed at conducting visitors on guided tours of the monument islands of Anacapa and, to a lesser extent, San Miguel and Santa Cruz, this service also facilitates en route nature observation. Boat captains regularly seek out gray whale pods during their northward (Jan.-March) migrations in the Santa Barbara Channel to observe and photograph (Connelly, 1979, personal communication). In the course of approaching Anacapa (west end) and Santa Cruz (north side), moreover, boats regularly pass at a safe distance from sea lion rookeries for similar purposes. Until recently, when they were restricted by California Department of Fish and Game's Ecological Reserve regulations for West Anacapa, such observational forays reportedly also included observations of brown pelican nesting grounds (Connelly, 1979, personal communication).

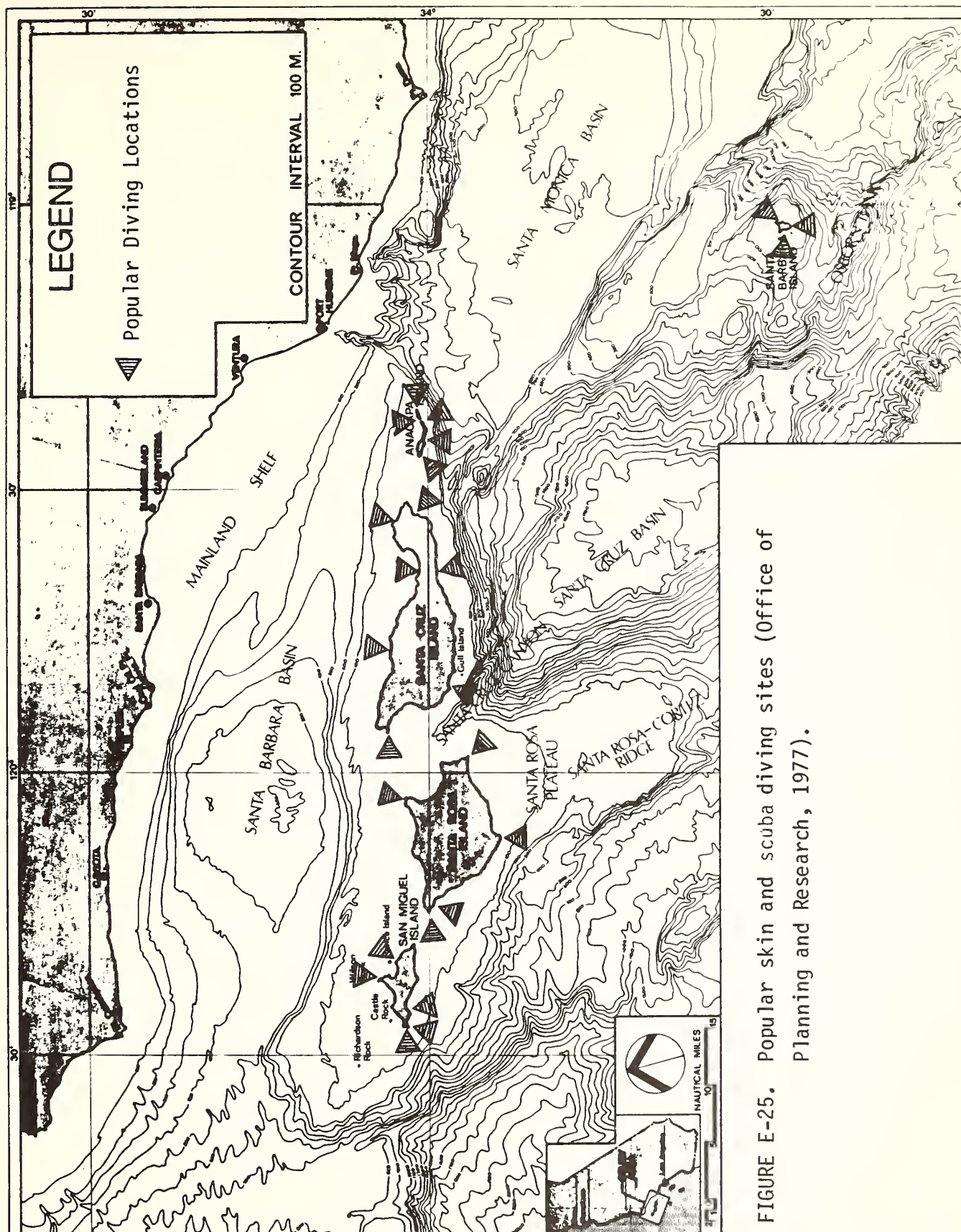
While the brunt of commercial boat visits by recreationists to the northern Channel Islands are centered upon Anacapa Island, more recently a special permit process has also been initiated for restricted tours (i.e., small ranger-accompanied) of San Miguel Island (which the NPS manages in league with the Department of the Navy). On Santa Cruz Island, having assumed majority ownership in late 1978, the California Nature Conservancy hopes to expand public visits as well, relying mostly upon commercial charter services such as the one currently in operation (Grumbine, 1979, personal communication).

Along the passive pleasure boating and nature observation, near-shore water zones around the northern Channel Islands and Santa Barbara Island are frequented by divers and spearfishing enthusiasts. Despite rather cold year-round water temperatures (normally necessitating wet suits), visual clarity is of such good quality, and protected cove shallows and kelp beds so numerous, that both

scuba and limited snorkeling activities thrive here. The presence of substantial stocks of lobsters and abalone also serves to attract many participants to this recreational use sector (Duthie, 1979, personal communication).

As inventoried by the California Governor's Office Task Force on the Offshore Continental Shelf, some 25 skin and scuba diving sites are evident in the northern Channel Islands, including 7 off Santa Cruz, 3 off Santa Barbara and 5 off each of Anacapa, Santa Rosa, and San Miguel (California Office of Planning and Research, 1977) (see Figure E-25).

Both party boaters and commercial charter operators engage in or facilitate diving activities, but there is as yet little information on their proportional contributions to total user demand or quantified areal concentrations. One "open" charter boat operator from Santa Barbara, for example, regularly transports paying SCUBA divers to San Miguel (Wilson Rock, Richardson Rock and Prince Island), Santa Rosa (Talcott Shoals), and Santa Cruz (Gull Island and Smuggler's Cove) (Duthie, 1979, personal communication). In these areas, most dives occur well within one-quarter mile of shore, and frequently in kelp beds. An estimated 50 percent of these recreationists carry spear guns on board and take both lobster and abalone. This particular operator indicated few, if any, concerns about user congestion, again highlighting the abundance of both open water space available in general and quality diving sites. Local diving clubs from communities along the mainland coast and elsewhere generate most of this operator's business (Duthie, 1979, personal communication).



Although not strictly marine-based, recreational flying is also a growing leisure pastime in the Santa Barbara Channel (Coffin, 1979, personal communication). Airports such as a county facility situated in Santa Barbara function as the primary staging points for this activity. Presently, two charter firms in the nearby mainland coastal region offer offshore overflights. Nature-watching during the gray whale's north and southward migration season is reportedly the most popular motive (90 percent) behind the demand for plane trips; a much smaller proportion of users charter aircraft purely to enjoy the unique scenic vistas provided by the offshore area's marine/island environment (Coffin, 1979, personal communication).

One of the charter companies, Santa Barbara Aviation, reports that they receive approximately six or eight requests per month for flights in and around the channel for nature observation (Glendinning, 1979, personal communication).

The peak season for recreational overflights lasts from April through September; and given the evidence of widening public interest in this activity, the frequency of charter services is likely to increase (Coffin, 1979, personal communication).

F. ALTERNATIVES

F.a. INTRODUCTION

Section F discusses six alternative actions for NOAA to take regarding the area under consideration. The first alternative presented is the possibility of not designating a sanctuary but instead relying on the existing system of controls. Alternative 2 is NOAA's preferred alternative, namely the designation of a marine sanctuary with the controls set forth in the draft designation document and proposed regulations in Appendix 1. Alternatives 3 through 6 include several different boundary, regulatory, and management options. These alternatives are discussed in comparison to the preferred alternative. Table F-1 summarizes the boundaries and controls considered for designation alternatives 2 through 6.

F.1 STATUS QUO ALTERNATIVE

F.1.a. INTRODUCTION

An alternative to designating a marine sanctuary is to rely solely on the State and Federal authorities currently in effect. This section sets forth the existing controls in the area under consideration which constitute this "status quo" alternative. Figure F-1 and Table F-1.a. summarize the various State and Federal controls discussed in this section.

TABLE F-1. Summary of boundary, activity regulation, and management alternatives for a marine sanctuary designation excluding the status quo alternative.

Alternative	Boundaries	Oil and Gas activities	Discharges	Seabed alterations	Vessel traffic	Overflights
2 (pref.)	6 nautical miles around the northern Channel Islands and Santa Barbara Island	No operations on new leases. Require additional onsite oil spill containment equipment	Prohibit except for vessel cooling waters, etc.	Prohibit within 2 nmi of the Islands.	Prohibit within 1 nmi of the Islands, except for fishing vessels etc. to the extent consistent with int. law.	Prohibit below 1000 feet within 1 nmi of the Islands, except to land on the Islands and to survey kelp beds.
3	6 nautical miles around the northern Channel Islands and Santa Barbara Island	No operations on new leases. No new rigs or platforms except on existing leases entirely in the sanctuary. Require additional onsite oil spill containment equipment	Same as alternative 2.	Prohibit within the sanctuary.	Prohibit within 1 nmi of the Islands, except for fishing vessels, etc. Require vessels to stay in VTSS's.	Prohibit below 1000 feet within 1 nmi of the Islands and below 500 feet in the sanctuary, except to land on the Islands and to survey kelp beds.
4	The entire Santa Barbara Channel and 12 nautical miles around the northern Channel Islands and Santa Barbara Island.	No operations on new leases within 6 nmi of the Islands. Require additional onsite oil spill containment equipment No structures in VTSS's.	Same, except within 3 nmi of the mainland.	Prohibit within 2 nmi of the Islands.	Same as alternative 3.	Same as alternative 2.
5	3 nautical miles beyond the territorial sea around the Islands.	No operations on new leases. Require additional onsite oil spill containment equipment	Same as alternative 2.	—	Relying on existing authorities.	—
6	The entire Channel excluding State waters and 12 nautical miles around the northern Channel Islands and Santa Barbara Island.	No operations on new leases within 6 nmi of the Islands. Require additional onsite oil spill containment equipment No structures in VTSS's.	Same as alternative 2.	—	Require vessels to stay in VTSS's.	—

TABLE F-1, cont.

Alter-native	Firearms	Historical resources	Fishing	Research/Education	Military Activities	Management
2		Prohibit removal and damage. Seek listing under the National Historic Preservation Act.	Rely on the California Department of Fish and Game and the Pacific Fishery Management Council.	Allow. Issue permits for some research or education to conduct activities otherwise prohibited.	Allow military activities necessary for national defense or emergency. NOAA will consult with the Department of Defense concerning specific activities.	Monitor resources and consult with other authorities. Establish Sanctuary Information Center. Maintain register of research projects. Encourage scientific research. Promote awareness of sanctuary resources. Compile an inventory and map historical resources. U.S. Coast Guard, National Park Service, National Marine Fisheries Service, and CDFG will enforce sanctuary regulations.
3	Prohibit use, except for military operations.	Same	Rely on CDFG and PFMC.	Same as alternative 2.	Same as alternative 2.	Same, but establish research zones.
4		Same	Rely on CDFG and PFMC	Same	Same	OCZM will coordinate management by existing authorities and establish a Channel Sanctuary Management Advisory Committee. Otherwise same as alternative 2.
		—	Rely on PFMC.	Same	Same	OCZM will coordinate and seek memoranda of understanding regarding consistency with the State. The U.S. Coast Guard, National Marine Fisheries Service, and possibly National Park Service will enforce sanctuary regulations. NOAA will not compile an inventory or map historical resources; otherwise same as alternative 2.
		—	Rely on PFMC.	Same	Same	OCZM will coordinate and seek memoranda of understanding regarding consistency with the State. The U.S. Coast Guard, National Marine Fisheries Service, and possibly National Park Service will enforce sanctuary regulations. NOAA will not compile an inventory or map historical resources; otherwise same as alternative 4.

Managed Resources and Activities

Management Authorities

Federal Authorities

State Authorities

	AA	CAA	CWA	ESA	FWMA	MBTA	MMPA	NIEPA	OCSLA	OPA	PMR	PWSA	SSVS	AGCA	ASBS	CMA	ER	FGC	HCRPA	OCS	WQCA
<u>Resource Protection</u>																					
1. Marine Mammals				FWS NMFS			NMFS FWS										DFG	DFG			
2. Marine Birds				FWS		FWS											DFG	DFG			
3. Fish/Shellfish					NMFS PFMC												DFG	DFG			
4. Research	NPS			NMFS			NMFS					USCG			WRCB	COC					
5. Recreation	NPS																				
6. Historic/Cultural	NPS HCPS							NPS HCPS									DFG		HRC		
<u>Activity Management</u>																					
1. Oil and Gas Development		EPA	COE EPA						BLM USGS											SIC	
--Exploration & Development									BLM USGS COE											SIC	
--Platform Placement									BLM USGS COE												
--Pipelines									BLM USGS COE												
--Water Discharges			EPA												WRCB						WRCB
--Air Discharges		EPA							USGS						ARB						
2. Fishing																					
3. Shipping					NMFS PFMC												DFG	PFMC DFG			
4. Military Operations	NPS	EPA	EPA							USCG	Navy	USCG	Air Force	ARB			DFG	DFG			WRCB
5. Research						FWS	NMFS FWS										DFG	DFG			
6. Recreation	NPS		USCG EPA														DFG	DFG			

FIGURE F-1. Existing Federal and State management authorities as they relate to resources and activities.

TABLE F-1a. Abbreviations of Authorities and Agencies

Abbreviations of Authorities

Federal

AA - Antiquities Act; 16 USC §§461-469i
 CAA - Clean Air Act; 42 USC §§7401-7642
 CWA - Clean Water Act; 33 USC §§1251-1376
 ESA - Endangered Species Act; 16 USC §§1531-1543
 FCMA - Fishery Conservation and Management Act; 16 USC §§1801-1882
 MBTA - Migratory Bird Treaty Act; 16 USC §§703-711
 MMPA - Marine Mammal Protection Act; 16 USC §§1361-1407
 NHPA - National Historic Preservation Act; 16 USC §§470-470n
 OCSLA - Outer Continental Shelf Lands Act; 43 USC §§1331-1343
 OPA - Oil Pollution Act of 1961; 33 USC §§1001-1016
 PMR - Pacific Missile Range; U.S. Navy
 PWSA - Ports and Waterways Safety Act; 33 USC §§1221-1227
 SSVS - Space Shuttle Vehicle System; U.S. Air Force

State

AQCA - Air Quality Control Act; California Health and Safety Code, §§39000-42708
 ASBS - Areas of Special Biological Significance; California Water Code §13260
 CCA - California Coastal Act; California Public Resources Code §27000
 ER - Ecological Reserves; California Fish and Game Code §1580
 FGC - Fish and Game Code; California Fish and Game Code, California Administrative Code, Title 14
 HCRPA - Historical and Cultural Resources Protection Act; California Public Resources Code §5000
 OGS - Oil and Gas Sanctuaries; California Public Resources Code §6870
 WQCA - Water Quality Control Act; California Water Code §13000

Abbreviations of Agencies

Federal

BLM - Bureau of Land Management - Department of the Interior
 COE - Army Corps of Engineers - Department of Defense
 EPA - Environmental Protection Agency
 FWS - Fish and Wildlife Service - Department of the Interior
 HCRS - Heritage Conservation and Recreation Service - Department of the Interior
 MMC - Marine Mammal Commission
 NMFS - National Marine Fisheries Service - Department of Commerce
 NPS - National Park Service - Department of the Interior
 PMFC - Pacific Fisheries Management Council; Joint Federal-State
 USCG - United States Coast Guard - Department of Transportation
 USGS - United States Geological Survey - Department of the Interior

State

ARB - Air Resources Board
 CCC - California Coastal Commission
 DFG - Department of Fish and Game
 HRC - Historic Resources Commission
 PFMC - Pacific Fisheries Management Council; (Joint Federal-State-Private Body)
 SLC - State Lands Commission
 WRCB - Water Resources Control Board

F.1.b EXISTING MANAGEMENT AUTHORITIES

F.1.b.i. STATE AUTHORITIES

The State's jurisdiction in the area under consideration extends three nmi (5.6km) miles offshore from the mean low tide line. State authorities range in approach and scope from broad regional management programs such as the California Coastal Act to laws intended to control specific threats or protect specific resources. The authorities with broad jurisdiction are described first, followed by those addressing a specific threat or resource, respectively.

The California Coastal Act of 1976 (CCA) (Cal. Pub. Res. Code 30000 et seq. (the CCA))

The California Coastal Act of 1976, Cal. Pub. Res. Code 30000 et seq. (the CCA), the foundation of the California Coastal Management Program, establishes a comprehensive set of specific policies for the protection of coastal resources and the management of orderly economic development throughout the coastal zone. The Act defines the coastal zone as the land and water area of the State extending seaward to the outer limit of the State's jurisdiction, including all offshore islands, and extending inland generally 1,000 yards from the mean high tide line. In significant coastal estuarine, habitat and recreational areas it extends inland to the first major ridgeline or five miles from mean high tide, whichever is less.

Activities in State waters must comply with the policies established by the CCA. In addition, seaward of State jurisdiction, Federal activities directly affecting the coastal zone and activities which require a Federal license or permit must be conducted in a manner consistent with these policies to the maximum extent practicable.

Provisions of the CCA which address activities or concerns relevant to the consideration of a marine sanctuary include:

- Article 4, Section 30230, granting "special protection to" areas and species of special biological or economic significance and requiring uses of the marine environment to be carried out so as to maintain biological productivity.
- Article 4, Section 30233, limiting dredging and filling in coastal waters to situations where "there is no feasible less environmentally damaging alternative and it is related to specific listed purposes."
- Article 5, Section 30240, protecting sensitive habitat areas against "any significant disruption of habitat values" and against impacts from adjacent development which would "significantly degrade" the area.
- Article 7, Section 30262, regulating oil and gas development.

The CCA establishes the California Coastal Commission (CCC) and six temporary commissions to implement the Act granting the CCC permit authority until such times as local governments adopt local coastal plans (LCP) approved by the Commission. The Southern Central Coastal Commission is currently supervising the preparation of local coastal programs which will include the study area.

A draft local coastal plan for Ventura County is expected to be completed by December, 1979. Anacapa Island is the only portion of the study area located within Ventura County. Due to the protection provided by the Channel Islands National Monument, it is expected that Anacapa Island will be minimally affected by the regulatory provisions of the LCP (Stanley, 1979, personal communication). Santa Barbara County, which includes all of the northern Channel Islands except Anacapa, will be releasing a hearing draft of its local coastal program to the Regional Commission in the fall of 1979. The program is expected to include extensive inventories of the Channel Islands. As with Anacapa Island above, the regulatory provisions of the LCP will only minimally affect Santa Barbara Island, because it is part of the Channel Islands National Monument, and San Miguel Island, because it is managed for the Navy by the National Park Service (Berry, 1979, personal communication).

In ocean areas, the California Coastal Commission will continue (after approval of local coastal programs) to be the permitting agency and will be responsible for certifying consistency for Federal activities. Local governments, with jurisdiction over areas affected by OCS activity, are invited by the CCC to participate in the public hearing(s), CCC deliberations, and to present determinations of whether OCS activity is consistent with the local coastal plan.

To facilitate early containment of an oil spill, the Commission has required one lease holder (Exxon on Tracts 222, 223, 230, 231, 232, and 238) to have certain oil spill containment and cleanup equipment, beyond that required by the USGS's OCS Order #7, on drillships or at the site at all times:

1) 1500 feet (424m) of open ocean containment boom and a boat capable of deploying the boom, 2) one oil skimming device capable of open ocean use, and 3) fifteen bales of oil sorbent material. Coastal Commission policy, for reasons of navigation safety and environmental protection, holds the placement of drillships in or within 500 meters of sea lanes established by the U. S. Coast Guard to be inconsistent with the Coastal Act.

Finally, the California Coastal Act requires the Commission to designate "Sensitive Coastal Resource Areas" which must then be acted upon by the Legislature within two years. The Commission, however, has preliminarily determined such designation may be unnecessary in view of the existing mechanisms available through the local coastal planning process.

Ecological Reserves (California Fish and Game Code §1580 et seq., Cal. 14 Admin. Code §630 et seq.)

The California Department of Fish and Game (DFG) has established ecological reserves in the ocean waters and tide and submerged lands surrounding San Miguel, Santa Barbara, and Anacapa Islands from the mean high tide line seaward 1 nmi (1.8km) (see Figure F-2).

Within these reserves, the California Department of Fish and Game has the authority to prohibit any activity which may harm the resources including specifically fishing, collecting, swimming, boating, aircraft, and public entry (California 14 Administrative Code §630(a)). General regulations provide that "no person shall disturb geological formations or archaeological artifacts or take

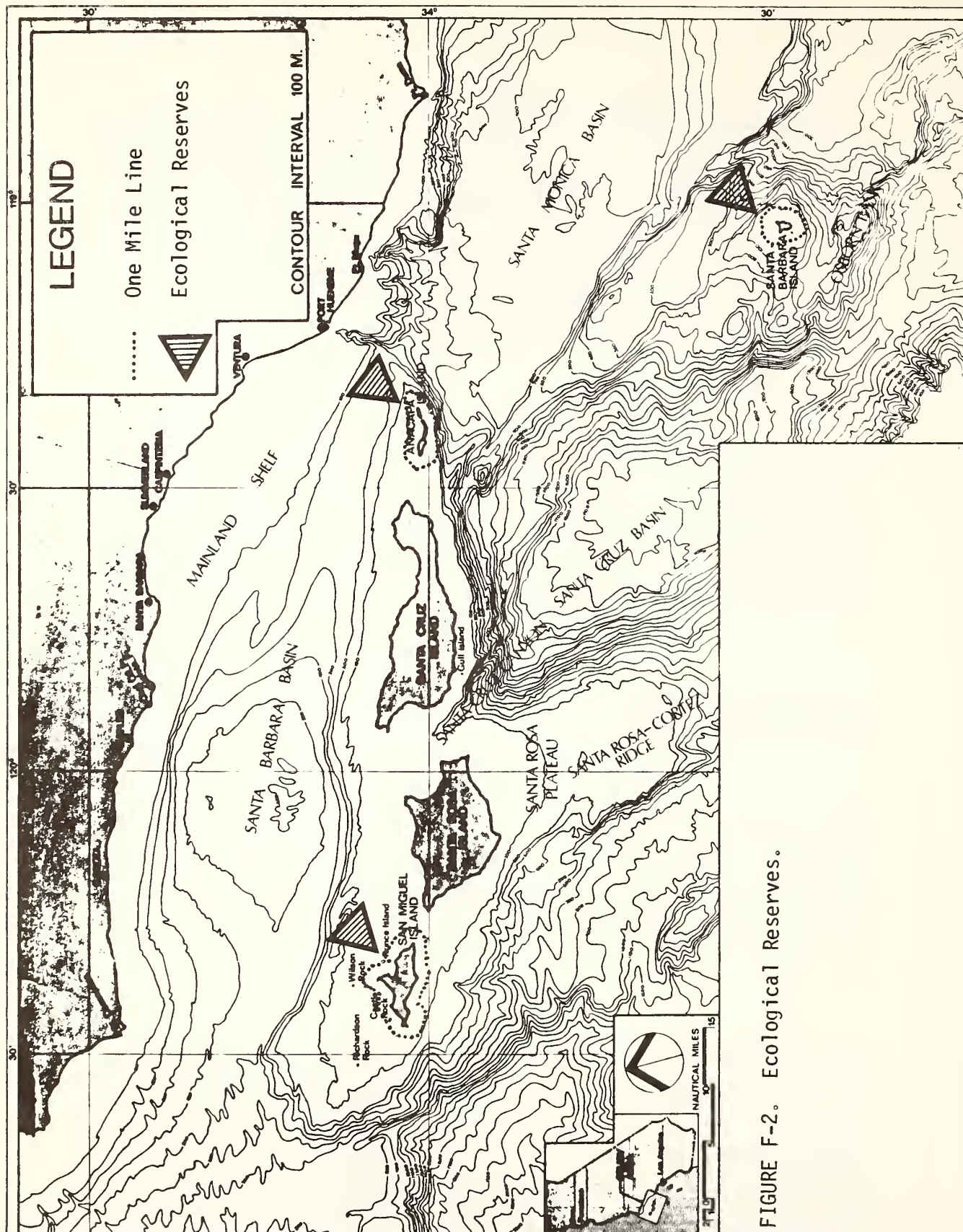


FIGURE F-2. Ecological Reserves.

or disturb any bird or nest, or eggs thereof, or any plant, mammal, fish, mollusk, crustacean...or any other form of plant or animal life in an ecological reserve" (California 14 Administrative Code §630 (a) (1)). These activities are, however, permitted by the Department of Fish and Game in particular reserves or in certain areas of particular reserves pursuant to specific regulations.

Boating is permitted in the San Miguel Island Reserve, except between Judith Rock and Castle Rock (Figure F-3) where all boat entry is prohibited within 300 yards (270m) offshore. Recently passed amendments (June 29, 1979), to take effect during the first week of August) permit boats to approach the Island between Judith Rock and Castle Rock to a distance of 100 yards (91m) from shore during the periods from March 15 through April 30 and October 1 through December 15. Persons who have been issued permits by the DFG to take sea urchins within the Point Bennett area or to dive for abalone may enter the 300 yard (270m) area between Judith Rock and Castle Rock for the purpose of fishing for abalone and sea urchins during the same periods. The DFG may rescind permission for boats to enter within 300 yards between Judith Rock and Castle Rock if it finds that impairment to the marine mammals of the Island is imminent. Boats traveling within 300 yards (270m) of the shoreline of the Island must operate with a minimum of noise and not exceed speeds of five miles per hour (14 California Administrative Code §630(b)(28)(C)) (Edgerton, 1979, personal communication). Overnight anchoring of boats, however, is permitted only at Tyler Bight and Cuyler Harbor. Furthermore, landing is allowed only by permit and only at the designated landing beach in Cuyler Harbor. Access to offshore rocks and islands within the reserve is allowed only by permit (California 14 Administrative Code §630(b)(28)(C)).

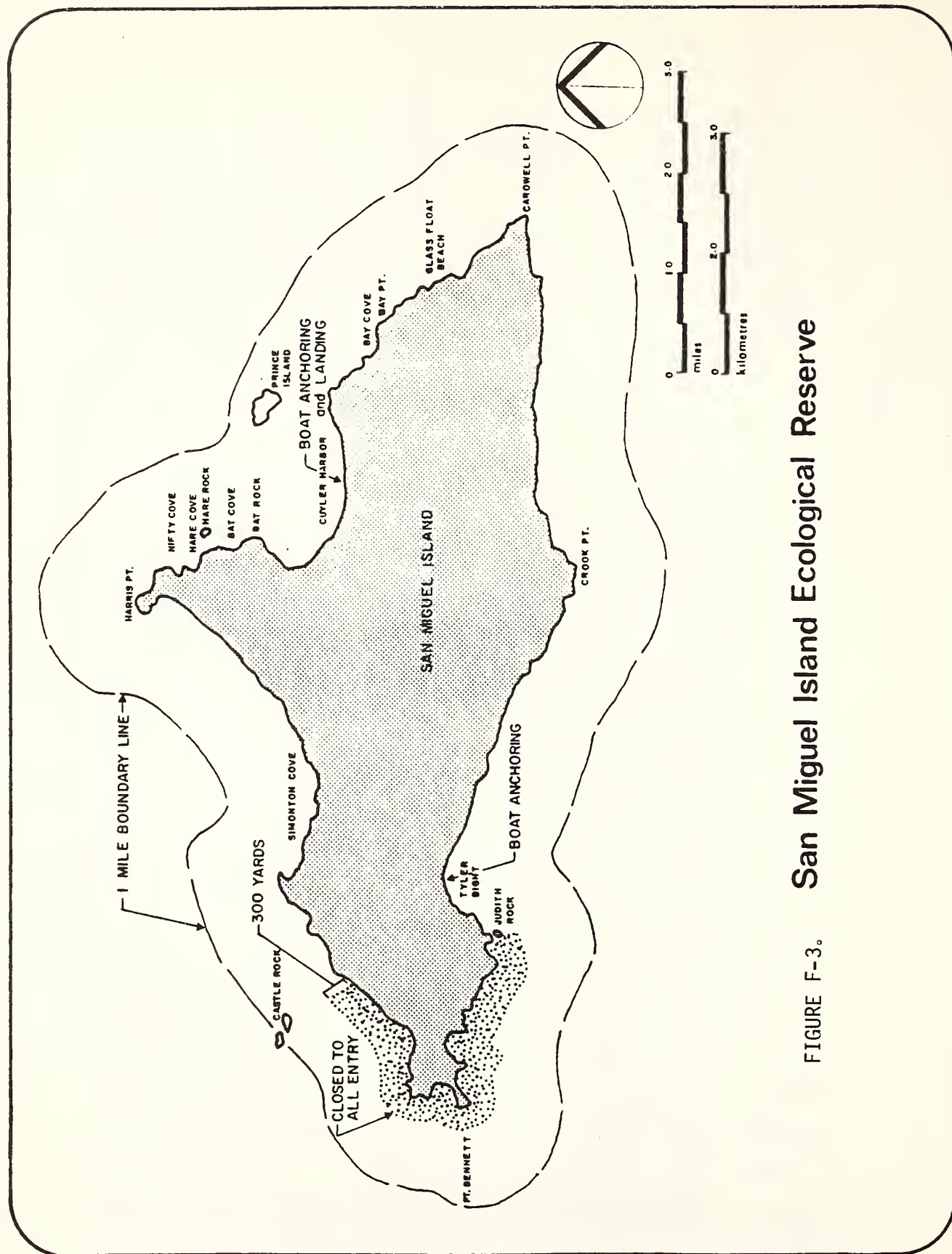


FIGURE F-3. San Miguel Island Ecological Reserve

In the San Miguel Island Ecological Reserve, swimming and diving are permitted in areas where boating is authorized (California 14 Administrative Code §630(b)(28)B)). Fishing from shore or in areas closed to boating is prohibited. Recreational fishing from boats is permitted in other areas of the reserve. Commercial fishing, except using hook and line gear or pursuant to abalone, lobster or sea urchin permits, is only allowed pursuant to a special permit (California 14 Administrative Code §630(b)(28)(A)).

The most direct resource protection in the Anacapa Island Ecological Reserve is a brown pelican fledging area established off the north shore of West Anacapa Island (see Figure F-4). Entry is prohibited during breeding season, March 1 to May 31 (California 14 Administrative Code §630(b)(31)(E)).

Boating, swimming and diving are otherwise allowed within the Anacapa Island Reserve (California 14 Administrative Code §630(b)(31)(A)). No nets or traps may be used anywhere within 450 ft (135m) of the island. Harvesting of kelp is prohibited within the reserve except by special permit.

A "natural area" has been established off the north shore of East Anacapa Island from which it is unlawful to take any native plant, fish, wildlife, aquatic organism or disturb any natural geological feature (California 14 Administrative Code §630(b)(31)(B)). Zones have been established off the southeast shore of the West Anacapa Island and the north shore of Middle Anacapa Island where taking of invertebrates from the mean high tide line to a depth of 20 ft (6.1m) is prohibited (California 14 Administrative Code §630(b)(31)(C)) (see Figure F-4). Commercial and sportfishing are allowed elsewhere in the reserve.

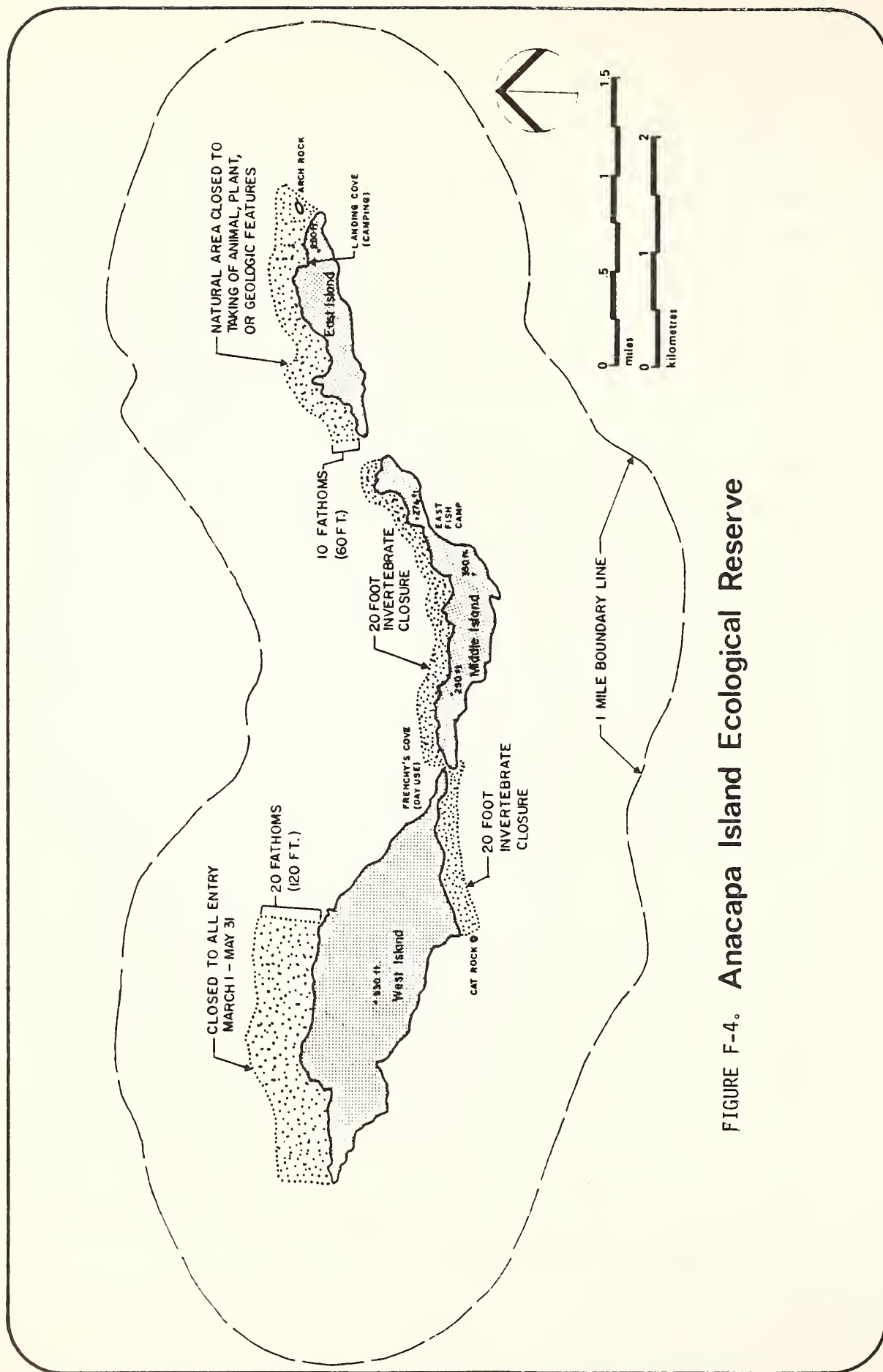


FIGURE F-4. Anacapa Island Ecological Reserve

Boating, swimming, sport and commercial fishing, and diving are generally permitted within the Santa Barbara Ecological Reserve (California 14 Administrative Code §630(b)(32)(A)). Within an area off the east shore of the Island, extending from the mean high tide line to a depth of 20 ft (6.1m) no invertebrates may be taken and no nets or traps may be used (California 14 Administrative Code §630(b)(32)(B) and (C) (see Figure F-5).

DFG personnel and facilities for enforcement of ecological reserve regulations consist of ten wardens and four boats. In addition to the ecological reserves, these personnel and facilities are responsible for enforcement of all of the Fish and Game Code and regulations for San Luis Obispo, Santa Barbara, and Ventura Counties. The four boats are: a 50-foot patrol boat with a small skiff on board, a 20-foot skiff, and a 17-foot skiff. The level of enforcement effort is dependent to a large extent on unpredictable weather conditions. Trips are made daily, weather conditions permitting, to Anacapa Island with the 50-foot patrol boat, the only boat large enough to cross the Santa Barbara Channel, manned by two wardens. Whenever possible, the patrol boat will then move on to other islands. Occasionally, stakeouts will be made for specific targets when violations are suspected (Martin, 1979, personal communication).

A cooperative agreement has been established between the Department of Fish and Game and the National Park Service (NPS) for the enforcement of California Fish and Game regulations in these reserves. The agreement was initiated to fully utilize the on-site enforcement capabilities of the Park Service, in terms of both personnel and facilities. Pursuant to this agreement, the

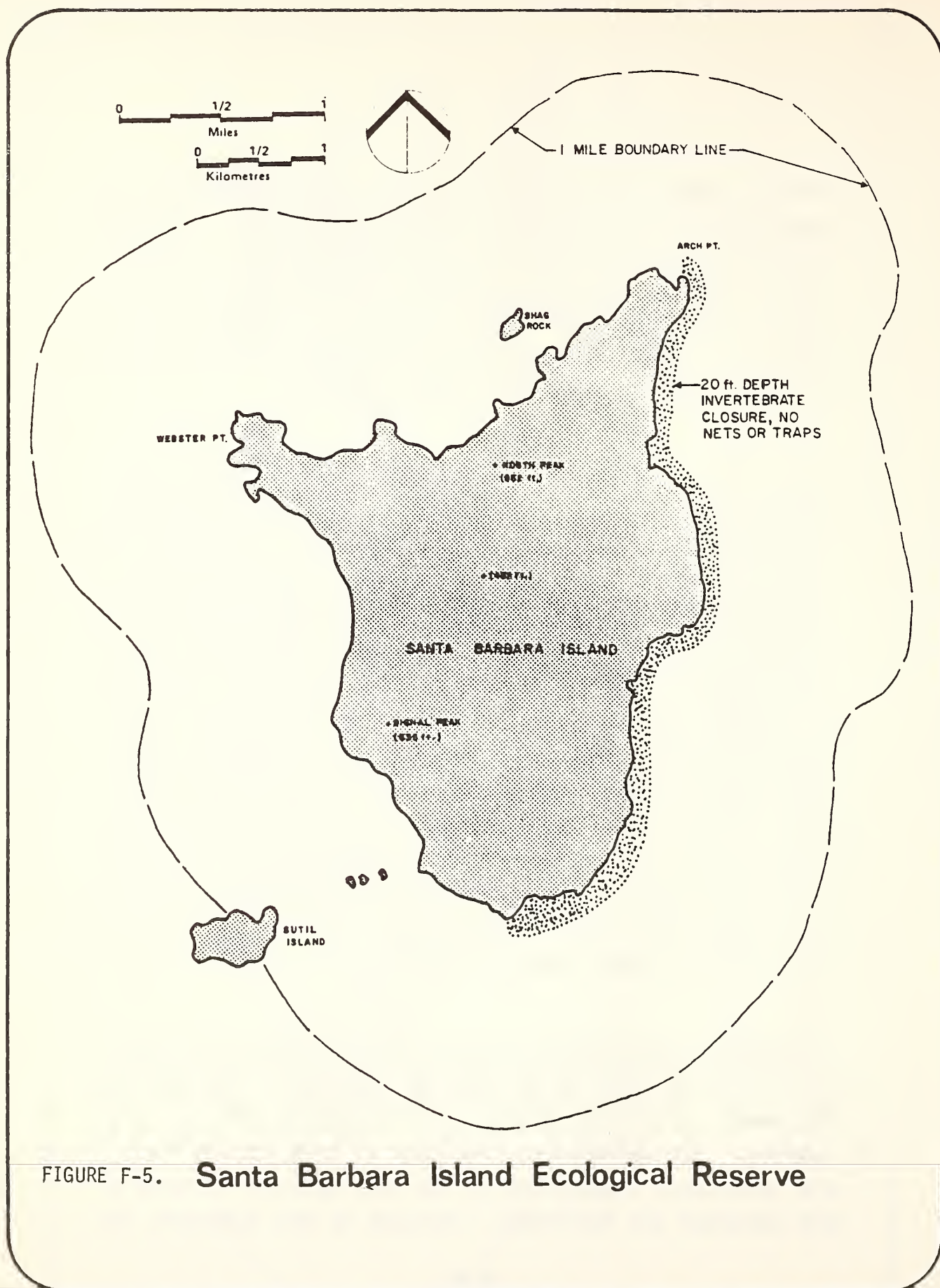


FIGURE F-5. Santa Barbara Island Ecological Reserve

seven Park Service rangers associated with the Channel Islands National Monument are deputized as Department of Fish and Game wardens and conduct patrol operations within the reserves. Regular joint training meetings are conducted by the DFG to keep NPS personnel abreast of changes in DFG regulations and policy (Cooperative Agreement between California Department of Fish and Game and U. S. National Park Service, 10/78; Johnson, 1979, personal communication; and Martin, 1979, personal communication).

Fish and Game Code (Chapter 14, Administrative Code)

The California Department of Fish and Game, under the Fish and Game Code (and Chapter 14 of the Administrative Code), regulates and manages a wide variety of activities affecting the fish and game resources found in the land and water areas under State jurisdiction. Specific Department of Fish and Game programs, other than ecological reserves (discussed above), of relevance to the study area include management of sport and commercial fishing, and plant harvesting, protection of endangered species, protection of migratory birds, coordination of the oil spill contingency plans, and restriction of overflights.

--Sport and commercial fishing and kelp harvesting management (California Fish and Game Code §7100 et seq.)

The Department of Fish and Game regulates sport fishing through license and bag limit systems. A sport fishing license is required for the taking and possession of fish for any non-commercial purpose (California Fish and Game Code §7100). Sport fishing of spiny lobster is restricted to collection by hoop nets or hand, and clam, mollusk, and crustacean collection are limited to the

period between one-half hour before sunrise to one-half hour after sunset (California Fish and Game Code §7256, 7290, and 7332). The Code does not specify bag limits for these resources.

Commercial fishing is also governed by a licensing system. Every person who operates or assists in using any boat or gear to take fish for profit must procure a license (California Fish and Game Code §7580); party boat operators must get special licenses (California Fish and Game Code §7920 et seq.). Vessels used in commercial fishing operations must also carry a Department of Fish and Game registration number (California Fish and Game Code §7880). Fishing reports, described in Sections 8010 et seq., must be supplied by buyers, processors, and anyone else who receives fish from fishermen. These reports form the basis of Department of Fish and Game statistics used in formulating fishery management policies. Species near the northern Channel Islands and Santa Barbara are subject to the seasonal, size, and catch restrictions listed in Table F-2.

Under the Submerged Lands Act of 1953 (43 USC §130(c)), California has jurisdiction over kelp within state waters as a seabed resource. Generally, a license is required to harvest kelp for profit (California Fish and Game Code §6650). As with other commercial fisheries, a record book must be maintained (California Fish and Game Code §6652).

Through a cooperative agreement recently reached between the Department of Fish and Game and the National Marine Fisheries Service, officials of both agencies may enforce each other's laws (see discussion below).

TABLE F-2. Catch restrictions for species of commercial fish in the northern Channel Islands area (references are to the California Fish and Game Code).

Catch restrictions for species of commercial fish in the northern Channel Islands area (references are to the California Fish and Game Code).

Sardines	Catch limited to 20,000 tons (or other DFG allowance) of the spawning population (Section 8150.7).
Anchovies	Restricted according to the PFMC plan.
Lobster	Fishery open between the first Wednesday in October and the first Wednesday after March 15 (Section 8251). Lobster permit required (Section 8254.7). Size restrictions exist (Section 8252).
Crab	Fishery open between the second Tuesday in November and June 30th (Section 8276).
Abalones	Fishery open each month but February and August (Section 8300). Abalone permit required (Section 8306). Size limits exist (Section 8304). Abalone diving permits exist and are limited in number (Sections 8306.1 and 8306.4). Black abalone taking within one mile of Santa Cruz and Anacapa Islands prohibited with some exceptions (Sections 8307.5, 8307.6).
Clams, Molluscs	Fishery open year round (Sections 8340 and 8341).
Scallops	Illegal to sell or purchase (Section 8345).
Saltwater and Anadromous fish	Kelp bass, sand bass, and spotted bass may be sold (Section 8372); yellowfin and bluefin tuna may be taken at any time (Section 8374); bluefin tuna must exceed 7 1/2 lbs to be marketed (Section 8375); albacore and skipjack may be taken any time (Section 8376 and 8378); white seabass, barracuda, and yellowtail not less than 28 in. in length may be taken by hook and line any time (Section 8382).
Mackerel	Catch limited as stock is enhanced (Section 8388.3).
California halibut	May be taken any time (Section 8391).
Swordfish	May be taken any time (Section 8394).

--Endangered species (California Fish and Game Code §2050 et seq.).

The California Department of Fish and Game maintains a list of rare and endangered species. It is unlawful within the state to take or possess any listed species. "Taking" is defined (California Fish and Game Code §2050 et seq.) in a manner analogous to the interpretation under the Federal act (see below). Listed species found in the study area are the Guadalupe fur seal, the California brown pelican, the California least tern, the light-footed clapper rail, and the Belding's savannah sparrow.

--Protection of Migratory Birds (California Fish and Game Code §355 et seq. and 3500 et seq.

In accordance with the Migratory Bird Treaty Act, California has provided protection for migratory birds, their nests and eggs by fixing areas, seasons, and hours plus bag and possession limits by species for migratory game birds (California Fish and Game Code §356). The peregrine falcon, brown pelican, California black rail and clapper rail, California least tern, light-footed clapper rail and southern bald eagle (California Fish and Game Code §3511) have all been accorded "fully protected" status, which protects these birds from taking except as authorized for scientific research.

--Oil Spill Contingency Plans (California Fish and Game Code §5650 et seq.)

It is unlawful to "deposit or permit any petroleum to pass into the waters of the State" (California Fish and Game Code §5650). The California Department of Fish and Game together with an Interagency Committee coordinates the State's oil spill contingency plan. Because Federal law preempts State regulation of oil spill cleanup operations, the State's role is that of observer, assistant, and advisor--with the important exception that the State has veto power over the use of chemical agents in State waters. In practice, State Department of Fish and Game personnel: 1) investigate all spills in State waters and many spills in Federal waters; 2) monitor, assist, and advise Federal and industry cleanup operations; and 3) maintain liaison between various government agencies and industry.

--Overflights (California Fish and Game Code §10501.5)

The California Department of Fish and Game prohibits overflights below 1000 ft (305m) over San Miguel, Santa Barbara, and Anacapa Islands.

Water Quality Control Act (California Water Code §13300 et seq.)

The Porter -Cologne Water Quality Control Act is designed to enhanced and maintain water quality in the waters, including ocean waters, under the jurisdiction of the State. The State Water Resources Control Board and the nine regional water quality control boards have primary authority for regulating water quality in California.

The Water Quality Control Plan for Ocean Waters of California (1978), which sets standards for water quality characteristics for ocean waters within State Jurisdiction, places particular emphasis on maintaining water quality in Areas of Special Biological Significance (ASBSs). The State Water Resources Control Board has designated ASBSs in the waters around the northern Channel Islands and Santa Barbara Island to a distance of 1 nmi (1.8km) offshore or to the 300 ft (90m) isobath, whichever is greater.

To be classified as an ASBS, an area of ocean water must be considered to contain biological communities of such extraordinary value that no risk of change in their environments resulting from human activities can be considered acceptable (California Water Resources Control Board, 1976). Dischargers must ensure that their wastes are discharged a sufficient distance from designated ASBSs to assure that the natural water quality conditions within the area are not affected. This is accomplished (i.e., administered) by Regional Water Quality Control Boards (RWQCBs) which, via a permit procedure, set waste discharge restrictions upon:

- a) elevated temperature wastes;
- b) discrete, point source sewage or industrial process wastes; and
- c) non-point source wastes such as, but not limited to, storm water runoff, silt, and urban runoff.

ASBS designations have no impact on vessel wastes, dredging control, or dredge spoil deposition because the California Ocean Plan, of which ASBS's are a part is not applicable to those activities.

RWQCBs are responsible for integrating ASBS designations into their area-wide basin plans which outline waste discharge prohibitions and restriction. A routine ASBS reconnaissance survey conducted by the SWRCB provides RWQBs with detailed resource information as well as data on existing or future activities apt to threaten their environmental quality. ASBS surveillance and monitoring is the responsibility of RWQCBs which ensure compliance with discharge regulations in the broader context of basin-wide enforcement. Should either an actual discharge violation or a threat therefore become apparent, the regional board is empowered with specific administrative procedures and remedies to enforce compliance (see California Water Code, Section 13300).

Though the primary intent of the designation is to protect marine life from waste water discharges, petroleum discharges into an ASBS are also covered (California Water Resources Control Board, 1976). Several study stations for the worldwide Mussel Watch Program, coordinated domestically by the U. S. Environmental Protection Agency, have been established within these ASBSs. Mussel watch stations are located in the shallow waters off Santa Barbara, Santa Cruz, and Anacapa Islands and two stations each have been established off San Miguel and Santa Rosa Island (California Water Resources Control Board, Annual Report, 1978). This program involves periodic tissue analysis of collected mussels as indicators of pollution levels. The establishment of these stations provides no special management of or protection for the research value of these sites, but does provide some information for monitoring purposes.

Regulation of Offshore Oil and Gas Development Activities,
Cunningham-Shell Tidelands Act, as Amended(California Public
Resources Code §6850 et seq.)

Leasing of state submerged lands (extending from the mean high tide line seaward 3 nmi (5.5km) for oil and gas development activities and regulation of these activities is the responsibility of the State Lands Commission. Both the State Lands Commission and the Coastal Commission regulate these activities to ensure that they proceed safely and that marine resources are adequately protected. In this regard, the State Lands Commission enforces requirements similar to those of the United States Geological Survey concerning blowout prevention, drilling practices, production procedures, pollution control, and oil spill prevention, containment and cleanup (see below).

In order to protect sensitive resource areas, the California State Legislature may designate Oil and Gas Sanctuaries in which petroleum development is prohibited within submerged lands. Oil and gas sanctuaries have been established in the waters around the northern Channel Islands. The sanctuaries extend from the mean high tide line seaward three nautical miles (California Public Resources Code §6871). Although leasing is normally excluded from the sanctuaries, if underlying oil and gas deposits might be drained by wells located on adjacent Federal lands thereby threatening the State's proprietary Interest in the resource, the State Lands Commission may open up the affected sanctuary areas for a drainage sale. The waters around Santa Barbara Island have not been declared an oil and gas sanctuary.

Control of Oil Discharges from Vessels (California Harbors and Navigation Code §133)

The California Harbors and Navigation Code generally applies to the activities of vessels operating in State waters. One of its purposes is to prevent the activities of vessels from adversely affecting the marine environment. To achieve this purpose, the discharge of oil from any vessel in the State's navigable waters is prohibited except in cases of "unavoidable accident, collision, or stranding" (California Harbors and Navigation Code §133).

Any person who intentionally or negligently causes or permits any oil to be deposited in the waters of the State is liable for cleanup costs and subject to a \$6,000 civil penalty (California Harbors and Navigation Code §151).

Air Resources (California Health and Safety Code §3900 et seq.).

The California Air Resources Board (ARB) is charged with the maintenance and enhancement of the ambient air quality of the State. The ARB has set air quality standards designed to meet National Ambient Air Quality Standards and delegated their implementation to local Air Pollution Control Districts (APCDs). The northern Channel Islands and Santa Barbara Island are located partly within the Santa Barbara County Air Pollution Control District and partly within the Ventura County Air Pollution District.

Generally, offshore oil and gas development facilities located within state waters must both obtain a permit from the appropriate APCD and meet ARB emission standards. ARB emission standards are also applicable to sources of emissions located beyond state waters that are related to an onshore facility. In essence, the permit for the onshore facility covers both. Emissions from offshore sources are considered together with those of the related onshore facility. The total emissions level must meet standards set by ARB as implemented by the appropriate APCD (Stamey, 1979, personal communication).

Emissions from tankers which dock at onshore facilities located in California are also considered together with those of the related onshore facility. As with onshore oil and gas development facilities, the total emissions level of the tanker and the related onshore facility must meet standards set by the ARB as implemented by the appropriate APCD. Unlike other offshore facilities, however, neither the ARB nor an APCD has authority to issue permits solely for tanker emissions (Stamey, 1979, personal communication).

Preservation of Historic Resources (California Public Resources Code §5020.4)

Preservation of representative and unique archaeological, paleontological, and historical sites in the land and water areas of the State is the responsibility of the California Historical Resources Commission. The Commission evaluates and makes recommendations to the State Historic Preservation Officer on nominations to the National Register pursuant to the National Historic Preservation

Act (see below). The Commission also recommends state registration of sites as landmarks and points of interest to the Public Resources Department which is responsible for maintenance of registered sites (California Public Resources Code §5020.4). Registration as a point of interest qualifies a site only for the placement of informational signs. Landmarks, along with properties listed on the National Register and city or county registers or inventories, become eligible for "qualified historic property" status for which special protection may be afforded by the Commission (California Public Resources Code §5031). At present, no sites within the study area have been registered as either landmarks or points of interest (Berry, 1979, personal communication).

Underwater State Parks

In order to protect special marine resources and water-based recreational values in ocean waters within State jurisdiction and to expand coastal park units beyond the water's edge, the California Department of Parks and Recreation has established an Underwater Parks Program (California Department of Parks and Recreation, 1979). As a result of a recently initiated underwater park study, underwater parks are being considered near San Miguel, Santa Cruz and Santa Rosa Islands (Kelly, 1979, personal communication), but at present, there are no underwater parks in the study area.

F.1.b.ii FEDERAL AUTHORITIES

Except where specified otherwise, Federal authorities apply throughout the entire area under consideration. The major exceptions are management of petroleum and fishery resources, which fall under State jurisdiction within three nautical miles (5.6km) of the shore.

Fishery Conservation and Management Act (FCMA) (16 USC §1801 et seq.)

The FCMA provides for the conservation and management of all fishery resources in the zone between three and two hundred nautical miles (5.6-370km) offshore. In the Channel Islands area, this authority is vested in the Pacific Fishery Management Council (PFMC). The National Marine Fisheries Service (NMFS) is charged with establishing guidelines for and approving those fishery management plans (FMPs) prepared by the PFMC for selected fisheries within its jurisdiction. These plans will determine the levels of commercial and sport fishing consistent with achieving and maintaining the optimum yield of each fishery.

The PFMC has already completed a management plan for anchovy and is currently preparing plans for groundfish and jack mackerel--all of which are found in the study area. The final anchovy FMP (Pacific Fishery Management Council, 1978a) proposes several fishing area closures, but none in the study area. Four different fishing seasons were proposed in the plan, some of which would prohibit fishing during important times of the life cycle of marine mammals and birds. A final decision on the preferred season is pending. The draft FMPs for groundfish (PFMC, 1978b) and jack mackerel (PFMC, 1979) address limitations on catch but do not consider closures. Although the FMP for groundfish is only in a draft stage, it does appear possible that the final FMP may aim

to protect intertidal spawning grounds and kelp bed habitats such as those found in the study area, which are vital to the survival of lingcod, bocaccio, and numerous rockfish.

The FCMA also applies to marine plant life. Therefore, the harvesting of kelp beds in Federal waters, such as Osborn Bank, south of Santa Barbara Island, could be regulated. No such plan is now being developed.

Benthic continental shelf fishery resources located outside State waters, such as abalone, lobster, crabs, sea urchins, and corals, are within the jurisdiction of the PFMC, the NMFS and the Bureau of Land Management (BLM) pursuant to the Outer Continental Shelf Lands Act (see below).

Endangered Species Act (16 UCS §§1531-1543)

The Federal endangered species program provides protection for listed species of marine mammals, birds, and fish in both State and Federal waters. The U. S. Fish and Wildlife Service (FWS) and NMFS determines which species need protection; FWS maintains a list of endangered and threatened species. The most significant protection provided by the Endangered Species Act is the prohibition on taking. The term "take" is defined quite broadly to mean "harrass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct" (16 USC §1532(14)). Fish and Wildlife Service regulations interpret the term harm to include significant environmental modification or degradation and acts which annoy listed species to such an extent as to significantly disrupt essential behavior patterns (50 CFR 17.3).

The Endangered Species Act also provides for the protection of endangered species and their habitat by establishing a consultation process designed to insure that projects authorized, funded or carried out by Federal agencies do not jeopardize the continued existence of endangered or threatened species, or "result in the destruction or modification of habitat of such species which is determined by the Secretary (of the Interior or Commerce) to be critical" (16 USC §1536). Critical habitat areas for endangered species are designated by the U. S. Fish and Wildlife Service and the National Marine Fisheries Service. The 1978 amendments to the Act establish a Cabinet level committee authorized to exempt Federal agencies from compliance with a determination by the Secretary of the Interior through an elaborate review process should an irreconcilable conflict occur. No critical habitat has been designated in the study area at this time.

Several species of marine mammals found in the waters around the northern Channel Islands and Santa Barbara Island are listed as endangered or threatened species. These include: 1) sea otter, 2) gray whale, 3) fin whale, and 4) humpback whale. The blue whale, sei whale, and sperm whale, all of which have been sighted elsewhere in the Southern California Bight, but not in the northern Channel Island vicinity, are also listed as endangered species.

Species of birds listed under the Endangered Species Act are found in the waters around the northern Channel Islands including: 1) California brown pelican, 2) light-footed clapper rail, and 3) California black rail, (44 CRF 3636, 1/17/79).

Marine Mammal Protection Act (MMPA) (16 USC §1361 et seq.)

The MMPA applies to any person subject to the jurisdiction of the United States in both State and International waters. It is designed to protect all species of marine mammals. While the MMPA allows States to petition for the return of management responsibility over marine mammals, California has done so only with regard to the sea otter and that petition was later withdrawn.

Provisions of the Act are implemented by the Department of Commerce, National Marine Fisheries Service (NMFS), which is responsible for whales, porpoises, and pinnipeds other than the walrus, the Department of Interior, U. S. Fish and Wildlife Service (FWS), which is responsible for all other marine mammals. An independent Federal body, the Marine Mammal Commission, advises these implementing agencies and sponsors relevant scientific research. The primary management features of the Act include: (1) a moratorium on the "taking" of marine mammals; (2) the development of a management approach designed to achieve an "optimum sustainable population" (OSP) for all species or population stocks of marine mammals; and (3) protection of populations determined to be "depleted".

The MMPA defines "take" quite broadly to include "harass, hunt, capture, or kill any marine mammal" (16 USC §1362(13), emphasis added). The term harass has been interpreted to encompass acts unintentionally affecting marine mammals such as operation of motor boats in waters in which these animals are found (Bean, 1977). However, this interpretation has not yet been tested in court. The MMPA allows four exceptions to the moratorium. The

two exceptions which have been applied in the Channel Islands are taking for scientific or display purposes and incidental to commercial fishing operations.

The Secretaries of the Interior and Commerce may also waive the moratorium on taking for particular species or populations of marine mammals under their jurisdiction provided that the species or population being considered is at or above its determined optimum sustainable population. No such waiver, however, has been granted concerning any marine mammal found in the area under consideration.

Secondly, the Act directs officials to seek "an optimum sustainable population (of marine mammals)" (16 USC §1361(6)). Optimum sustainable population (OSP) is defined to mean "the number of animals which will result in the maximum productivity of the population or species keeping in mind the carrying capacity of the habitat and health of the ecosystem of which they form a constituent element" (16 USC §1352(9)).

Marine mammal species whose population is determined to be depleted receive additional protection (16 USC §1362). During the moratorium no permit may be issued for the taking of a marine mammal determined to be depleted unless the taking is for scientific research purposes. Three species of marine mammals sighted within the study area (the fin whale, the humpback whale and the gray whale), and four species or populations which are possible transients (the blue whale, the southern population of sea otter, the sperm whale, and the sei whale), are treated as "depleted" based on their listing as endangered or threatened species under the Endangered Species Act.

Migratory Bird Treaty Act (MBTA) (16 USC §§703 et seq.)

In the northern Channel Islands area, hunting for migratory birds other than species of ducks, geese, coots, gallinules, and doves is generally prohibited throughout the year, pursuant to the Migratory Bird Treaty Act which implements international conventions with Great Britain and Japan. Each convention establishes a "close season" during which no hunting is permitted, which for migratory birds other than game birds is year round. The essential provision of the Act makes it unlawful except as permitted by regulations "to hunt, take, capture...any migratory bird, any part, nest or egg" of any bird protected by the Convention (16 USC §703). The California Department of Fish and Game has supplemented this authority with its own regulations (see Fish and Game Code discussion, above).

Clean Water Act (CWA) (33 USC §1751 et seq.)

It is the goal of the CWA to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Waters in the territorial sea, the contiguous zone, and in the ocean beyond are subject to varying requirements under the CWA.

The CWA's chief mechanism for preventing and reducing water pollution is the National Pollutant Discharge Elimination System (NPDES), administered by the Environmental Protection Agency (EPA). Under the NPDES program, a permit is required for the discharge of any pollutant from a point source into navigable waters (which include State waters, the contiguous zone, and the ocean). Within California State waters, EPA has delegated NPDES

permitting authority to the State government.

Since oil and gas development resulting from Federal lease sales will occur outside State waters, an NPDES permit from EPA will be required for discharges associated with this activity. EPA's decision to grant a NPDES permit for offshore oil and gas developments is based primarily on the effluent guidelines shown in Table F-3 (40 CFR §435). Other conditions beyond these guidelines can, however, be imposed by the Regional Administrator on a case-by-case basis. For instance, to conform with BLM stipulations special conditions for NPDES permits have been applied to several leases from OCS Sale No. 35 in the vicinity of Tanner and Cortes Banks, a hard bank community southwest of the northern Channel Islands. To protect the bank resources, discharges of drilling mud are not allowed over the banks.

The CWA prohibits the discharge of oil and hazardous substances in such quantities as may be harmful (33 USC §1321(b) (3)), except discharges outside the territorial sea permitted by the International Convention for the Prevention of the Sea by Oil, 1954 (see Oil Pollution Act below). When such discharges do take place, the National Contingency Plan (NCP) for the removal of oil and hazardous substance discharges (33 USC §1321(c); Executive Order 11735, Aug. 3, 1973), which is designed to minimize the impacts on marine resources, will take effect. The Coast Guard, in cooperation with EPA, administers the Plan, which applies to all discharges of oil in the contiguous zone and to activities under the OCSLA. As a result of a memorandum of understanding between the Secretaries of Transportation and the Interior, however, the USGS has exclusive authority to institute measures to abate the source of pollution (United States Departments of the Interior and Transportation, Memorandum of Understanding, (8/16/71)). The NCP establishes the

TABLE F-3. EPA Effluent Guidelines and Standards for Far Offshore*
Oil and Gas Extraction Facilities (40 CFR Pt 435).

Effluent limitations			
Pollutant parameter waste source	Oil and Grease		Residual chlorine, mini- mum for any 1 d, milligram per liter
	Maximum for any 1 d, milligram per liter	Average of daily values for 30 consecu- tive days shall not exceed, milligram per liter	
Produced Water-----	72	48	NA
Deck Drainage-----	72	48	NA
Drilling muds-----	(1)	(1)	NA
Drill cuttings-----	(1)	(1)	NA
Well treatment-----	(1)	(1)	NA
Sanitary:			
M10-----	NA	NA	1 ²
M9IM ³ -----	NA	NA	NA
Domestic ³ -----	NA	NA	NA
Produced sand-----	(1)	(1)	NA

¹No discharge of free oil.

²Minimum of 1 mg/l and maintained as close to this concentration as possible.

³There shall be no floating solids as a result of the discharge of these wastes.

NOTE: M10 means facilities continuously manned by ten (10) or more persons. M9IM means facilities continuously manned by nine (9) or less persons or intermittently manned by any number of persons.

*beyond 3 nmi.

organizational framework whereby oil spills are to be cleaned up. To carry out the national plan, regional plans have been established; the Coast Guard has issued such a plan for Federal Region 9 which encompasses the northern Channel Islands and Santa Barbara Island. Under the plan, Coast Guard personnel are to investigate all reported offshore spills, notify the party responsible (if known) of his obligation to clean up the spill, and supervise the cleanup operation. The Coast Guard retains final authority over the procedures and equipment used in the cleanup. If the party responsible for the spill does not promptly begin cleanup operations, the Coast Guard can hire private organizations.

Permits from the Army Corps of Engineers, which are based on EPA-developed guidelines, are required prior to discharging dredged materials within three miles of shore (33 USC §1344), or the transportation of dredged material for the purpose of dumping it into ocean waters (33 USC §1413) (see discussion of the Ocean Dumping Act below.)

Finally, the CWA requires noncommercial craft to comply with marine sanitation regulations issued by EPA and enforced by the Coast Guard (33 USC §1322).

Ports and Waterways Safety Act, as amended (PWSA) (33 USC §1221)

The Ports and Waterways Safety Act (PWSA), as amended by the Port and Tanker Safety Act of 1978, is designed to promote navigation and vessel safety and the protection of the marine environment. The PWSA applies both in State waters and in high seas out to 200 nmi (370km)

The PWSA authorizes the U. S. Coast Guard to establish vessel traffic services and systems for ports, harbors and other waters subject to congested vessel traffic. In the Santa Barbara Channel, the U. S. Coast Guard has established a Traffic Separation Scheme (TSS) consisting of two one-mile wide vessel traffic lanes, with a two-mile separation zone.

The lanes are designed to prevent vessel collisions by separating vessels going in opposite directions. The TSS has been officially recognized by the Intergovernmental Maritime Consultative Organization (IMCO), and appears as recommended traffic routes on all navigation charts of the area.

The TSS, which applies to commercial ships other than fishing vessels, is violated when a vessel is in a designated lane but moving in the wrong direction. Violators are subject to flag state enforcement if their violation occurs outside the three mile territorial sea. If a violation occurs within the territorial sea, the U. S. may take enforcement action. Outside the traffic lanes, vessels may proceed in any direction consistent with good seamanship.

In addition to vessel traffic control, the Coast Guard regulates other navigation and shipping activities related to vessel design, construction, and operation designed to minimize the likelihood of an accident and reduce vessel source pollution.

The 1978 Amendments establish a comprehensive program for regulating the design, construction, operation, equipping, and manning of all tankers using U. S. ports to transfer oil and hazardous materials. These requirements are, for the most part, in agreement with protocols passed in 1978 to the International Convention for the Prevention of Pollution from Ships, 1973, and the International Convention on Safety of Life at Sea, 1974 (33 USC §1221).

The USCG is also vested with the primary responsibility for maintaining boater safety, including the tasks of conducting routine vessel inspections and coordinating rescue operations.

Oil Pollution Act of 1961 (33 USC §§1001-1016)

The Oil Pollution Act of 1961 (which implements the International Convention for the Prevention of Pollution of the Sea by Oil of 1954) regulates discharges of oil or oily mixtures from vessels with the exception of tankers of less than 150 gross tons and other vessels of less than 500 gross tons. With the exception of discharges from machinery space bilges, tankers subject to the act may not discharge oil or oily mixtures unless they are 50 nmi (93km) from the nearest land and the total quantity of oil discharged does not exceed 1/15,000 of the total cargo capacity. Discharges from other vessels regulated by the act, and discharges from the machinery bilges of tankers, must be made as far as practicable from land and may not have an oil content of more than 100 parts per million. In addition to the above requirements, a discharge by any vessel regulated by the act must be made while the vessel is en route and the instantaneous discharge rate must not exceed sixty liters per mile.

Clean Air Act (42 USC §7401 et seq.)

The Clean Air Act (CAA) sets general guidelines and minimal air quality standards on a nationwide basis in order to protect and enhance the quality of the nation's air resources. States are responsible for developing comprehensive plans for all regions within their boundaries. Thus, as noted above, discharges of air pollutants within California State waters are subject to the control of the California Air Resources Board.

Beyond State waters, EPA Region IX, relying on an EPA Office of General Counsel's opinion, has asserted that the new source and prevention of significant deterioration (PSD) provisions of the CAA apply to new sources on the OCS that can adversely affect air quality over the United States (EPA Office of General Counsel Opinion (4/18/78)). These regulations would supplement DOI OCS air quality regulations. The new source and PSD provisions apply only to stationary sources which emit, or could emit, at least 100 tons per year of any air pollutant. Exxon's platform Hondo in the Santa Ynez Unit north of the northern Channel Islands (which includes an oil processing plant) is an example of such a major facility near the sanctuary study area.

Outer Continental Shelf Lands Act (43 USC §1331 et seq.)

The Outer Continental Shelf Lands Act, as amended in 1978 (OCSLA), establishes Federal jurisdiction over the mineral resources of the Outer Continental Shelf (OCS) beyond three nmi (5.6km) and gives the Secretary of Interior prime responsibility for managing OCS mineral exploration and development. The Secretary's responsi-

bility has been delegated to two bureaus within the Department: the Bureau of Land Management (BLM) and the U. S. Geological Survey (USGS).

BLM has overall responsibility for leasing OCS lands. In the Santa Barbara Channel, lease sales have been held in 1966, 1968, and 1975 (Sale #35), and June, 1979 (Sale #48).

In unique or special areas, the BLM may impose special lease stipulations designed to protect the specific geological and biological resources found in those areas. These stipulations may vary from lease tract to lease tract and sale to sale.

In the FEIS on Sale #48 (U. S. BLM, 1979), BLM has recommended seven lease stipulations (see Appendix 5), three of which are of particular importance to resource protection.

Stipulation Number 3 concerns the protection of cultural resources. If surveys indicate the possibility of a cultural resource, the lessee shall: (1) locate all structures so that they will not adversely affect the resource or (2) establish to the satisfaction of the U. S. Geological Survey Area Supervisor either that no adverse effects will result from the operation or that the potential cultural resource suggested by the survey does not exist. Stipulation No. 5 requires prevention, to the maximum extent possible, of harm to newly discovered areas of special biological interest including: (1) areas containing rare ecosystems; (2) areas of abundant numbers and/or high diversity of species; (3) areas containing species of limited regional distribution; (4) areas critical to the life cycle of species; and (5) areas which are protected by fishery management plans as singu-

larly important to a species (U.S. Bureau of Land Management, 1979). Stipulation No. 4, which only applies to tracts 001-108* (see Figures E-19 and E-20), in the Santa Barbara Channel, concerns protection of commercial trawl grounds from subsea completion systems and pipelines.

The USGS is charged with approving plans for exploratory drilling and development and supervising OCS operations. Several types of regulatory authority are used by USGS in carrying out the latter responsibility. These include enforcement of regulations pursuant to the OCSLA (30 CFR Part 250) and the stipulations applicable to particular leases discussed above. In addition, OCS Orders have been issued by the USGS to supplement regulations in particular regions. Twelve such Orders have been issued for the Pacific region and three more are under review (see Appendix 6). These Orders apply to various aspects of the day-to-day drilling and production operation, including: (1) marking of platforms and structures; (2) general drilling well procedures; (3) testing of blowout preventers; (4) characteristics and use of drilling muds; (5) plugging and abandonment of wells; (6) contingency plans; (7) oil spill pollution equipment; (8) oil spill reports; (9) subsurface safety devices; (10) pollution and waste disposal; and (11) design and maintenance of oil and gas pipelines.

The USGS also issues Notices to Lessees and Operators when clarifications, corrections, or additions to OCS Orders and Regulations are necessary. These notices have the same status as OCS Orders and Regulations and are used to keep lessees and operators informed of USGS's requirements (see Appendix 6).

*Note that tracts 088-108 have been withdrawn by the Secretary of the Interior from Sale #48 (U.S. Department of Interior, 1979).

Certain provisions of the 1978 OCSLA Amendments are of importance. If the Secretary of the Interior determines that continued OCS operation threatens "serious, irreparable, or immediate harm or damage to life, including fish and other marine life" or the "the marine, coastal or human environment, such operations may be suspended (16 USC §1334 (c)(1)). In addition, if it is found that regulations, lease provisions, or exploration and development plans, are violated by the lessee, the lease may be cancelled and forfeited (16 USC §1334 (d)).

Finally, the DOI, through the USGS, is developing regulations to control air emissions occurring on the OCS that significantly affect a State's air quality. According to Proposed Rule 30 CFR Part 250 (43 Fed. Reg. 27449 (5/10/79)), activities on the OCS will not be approved if they prevent any State from achieving or maintaining national ambient air quality standards (NAAQSs). The DOI proposes to require lessees to include in their exploration, development, and production plans specific information concerning emissions and their effects on coastal areas. It is presently unclear whether standards designed to prevent significant deterioration will also be applied.

Other agencies within DOI--including the FWS, NPS, and HCRS--are consulted on various potential impacts from OCS development including necessary stipulations pursuant to Secretarial Order No. 2974 of August, 1978.

In addition to DOI, both the Army Corps of Engineers (COE) and the U. S. Coast Guard (USCG) have some responsibility over OCS mineral development. COE is responsible for ensuring, through a permit system, that OCS structures including pipelines, platforms, drill ships, and semi-submersibles do not obstruct navigation (43 USC

§1333 (f)). USCG ensures that structures on the OCS are properly marked (43 USC §1333 (e)).

Marine Protection, Research, and Sanctuaries Act (33 USC §§1401-1444)

Title I of the Marine Protection, Research and Sanctuaries Act (MPRSA), also known as the Ocean Dumping Act, regulates the dumping of materials into the territorial sea (i.e., State waters), the contiguous zone and the ocean beyond. EPA regulates, through the issuance of permits, the dumping of all materials except dredged materials; COE exercises authority over the dumping of dredged materials.

Five dredge material disposal sites have been established in the Southern California Bight, with the closest one to the Channel Islands being near Port Hueneme, about 16.6km (9 nmi) from Anacapa Island. No ocean dumping of nondredged materials has occurred in the Bight since 1972. Prior to 1972, munitions, toxic wastes, and radioactive materials were dumped in the vicinity of the Channel Islands, but more than 18.5km (10 nmi) from the Islands.

National Historic Preservation Act (16 USC §470)

The National Historic Preservation Act (16 USC §470) authorized the Secretary of the Interior to maintain a national register of "districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, and culture." Sites have been listed on the National Register which include or are composed entirely of ocean waters and submerged lands within

state waters or on the Outer Continental Shelf (Lebovich, 1979), personal communication). No sites on the northern Channel Island are listed on the National Register at the present time; two have been nominated, the Anacapa Lighthouse and the Channel Islands Archeological District (44 FR 52893 (September 11, 1979)).

Should these or any other sites on the shores or in the waters around the Islands be listed on the National Register, any Federal agency conducting, licensing, or assisting an undertaking which may affect a listed site must provide the Advisory Council on Historic Preservation a reasonable opportunity to comment on the action (16 USC §470f). The criterion applied by the Council is whether the undertaking will change the quality of the site's historic architectural, archaeological or cultural character (36 CFR §800).

Antiquities Act (16 USC §431)

Channel Islands National Monument and National Park Service Management of San Miguel Island

The Antiquities Act authorized the President to reserve by Proclamation lands "owned or controlled by the Government of the United States" for use as national monuments. National monuments so proclaimed become part of the National Park System and are administered by the National Park Service. The Channel Islands National Monument was established pursuant to this Act by Presidential Proclamation No. 2281 in 1938 (52 Stat. 1541). Several bills to create a National Park on the northern Channel Islands and Santa Barbara Island are now before the Congress (see Section F.2.d.).

The National Park Service (NPS) has responsibility for managing the Channel Islands National Monument which includes Anacapa and Santa Barbara Islands. Until May of 1978, the National Monument also included the waters surrounding the two islands out to one mile (63 Stat. 1258 (2/9/49)). Authority over these submerged lands was returned to the State in United States v. California (11 ERC 1651 (1978)). The jurisdictional authority of the NPS, therefore extends only to the mean high tide line of each Island. The NPS, however, through an agreement with California DFG, does have joint authority for enforcing DFG regulations in the waters out to one mile. (Cooperative Agreement between California Department of Fish and Game and the U.S. National Park Service, 10/78).

The NPS also acts as joint administrator of San Miguel Island through a 1963 Memorandum of Agreement with the Navy. In a 1976 Amendment to that Agreement, the Navy declared that if it no longer required use of the island, it would seek authorization for it to become part of the National Park System. However, both the Amendment and the NPS Statement for Management issued for the Island reiterated that the continuing priority use of the Island will be for Naval operations (NPS, 1978).

NPS management policies for the Monument and San Miguel Island are designed to protect the natural and cultural resources of the Islands while providing an appropriate level of opportunity for public enjoyment of those resources.

The NPS Statement for Management for the National Monument describes a land classification scheme that creates Natural Zones which are to remain largely unaltered by human activity. Most importantly, West Anacapa Island is designated an "Environmental Protection Subzone," for the protection of the Brown Pelican, and East Anacapa and the Arch Rock Group are "Outstanding Natural Features Subzones" (National Park Service, 1976). The Statement for Management for San Miguel and Prince Islands establishes Natural Zones similar to those designated in the Monument (NPS, 1978).

Of greatest relevance to the resources of the study area are NPS management policies concerning visiting. Except for boat access via certain areas off San Miguel Island where entry is restricted by the Navy (see below), the NPS controls visitor access to San Miguel, Anacapa, and Santa Barbara Islands as well as the activities of visitors. Prohibition of or restrictions on visitor ingress and egress to and from certain parts of the islands managed by the NPS tend to discourage other activities which could harm the marine resources found in the waters adjacent to those areas. Such activities include boat anchoring, fishing with nets, swimming, diving, and collecting of artifacts. In addition, restrictions on visitor access and the activities of visitors will protect the living marine resources of the study area, most importantly marine mammals and birds, by preventing potential disturbance. Most important in this regard is the Environmental Protection Subzone established on West Anacapa Island for the protection of the Brown Pelican rookery (NPS, 1976).

Visits to the islands managed by the NPS are generally controlled by a permit system, through which the number of visitors, length of stay, and time of visit may be restricted. Severe restrictions are placed on visits to West Anacapa to protect the Brown Pelican rookery there. Policies for the other Anacapas and Santa Barbara are considerably more liberal. Santa Barbara receives the most visitors (Whelan, 1979, personal communication).

Visitation levels at San Miguel are limited by restrictions on access imposed by DFG, the Navy, and the NPS and the lack of facilities on the Island. Enforcement responsibilities of the Park Service are carried out by seven rangers. Two boats, a 40-foot patrol boat and a 20-foot skiff are used for patrols in marine areas (Johnson, 1979, personal communication).

U. S. Navy

The U. S. Navy conducts numerous military operations in and over the waters offshore of southern California. Various portions of the study area are within military districts operated by the Navy: the northern Channel Islands are within the Pacific Missile Range; the waters south of Santa Cruz Island are part of an Acoustic Range Facility; and Santa Barbara Island is located in the southwest corner of a Fleet Operating Area and is also just north of the Santa Barbara Island Training Area. The Pacific Missile Test Center at Point Mugu schedules control of the Navy operating areas in the vicinity of the Channel Islands. Each week, the U. S. Coast Guard publishes a "Local Notice to Mariners", which projects the use of the military operating areas.

The Navy routinely conducts bombing practice and missile discrimination operations in the airspace over the waters just south of San Miguel Island. A Naval Danger Zone has been established which extends 3 nmi (5.5km) seaward of the eastern half of San Miguel Island. In this zone, the Navy permits nonmilitary uses, including recreational use, only when the area is not being used for military operations. Bombing practice runs take place in this zone approximately 200 times a year. Because of the short notice and intermittent nature of these exercises, long range planning of recreational activities in the zone will be difficult; the Navy does, however, attempt to provide some advance notification through the use of signs and map designations. The Navy retains the right to escort boaters and other recreationalists violating the zone away from the target area.

Although the Navy owns San Miguel Island, the National Park Service, by agreement with the Navy, administers the Island proper. By this agreement, the Navy has relinquished all authority to manage the resources of the Island and surrounding waters, except within the Naval Danger Zone discussed above. The Navy has agreed to attempt to conduct its operations in a manner which will cause the least impact to Island resources. The sites selected for and frequency of operations reflect this policy.

U. S. Air Force

The Air Force will regulate the Space Shuttle Vehicle System which is to operate out of the Vandenberg Air Force Base in Santa Barbara County. The Air Force is currently conducting a study to determine the impacts on the Island fauna, particularly marine

birds and mammals, of the supersonic boom accompanying the flight of the shuttle.

F.1.c. Environmental Consequences

Numerous authorities have the power both to regulate uses in the study area and to manage individual resources. Nevertheless, NOAA's review of the existing State and Federal management system indicates that the extraordinary diversity of natural resources concentrated around the northern Channel Islands and Santa Barbara Island warrants additional protection beyond that provided by the present institutional structure. Although certain uses of the area and certain conduct do not now seriously threaten resource quality here, they could have more significant impact if and when activity intensities grow. The current multitude of regulatory authorities, for example, many of which have different objectives and jurisdictions, could bring about policy conflicts and diminish overall management effectiveness as use pressures mount. Furthermore, some agencies suffer from limited enforcement resources. No unified regulatory mechanism exists to protect the study areas from future activities which may pose serious threats to acknowledged marine resources. Because Island waters contain so many valuable resources which in turn support so many beneficial uses, they require special acknowledgement and study to ensure that they are used and preserved in the future as effectively as possible.

Habitat and Species Protection

The present regulatory system does not provide for the preservation and protection of exceptional marine habitats from the full range of potentially harmful activity, as is discussed in more detail below. Although the Departments of the Interior and Commerce have authority to designate and protect critical habitats for species listed as "endangered" under the Endangered Species Act (ESA), no Federal authority currently exists to identify and protect localized marine habitats of exceptional importance to nonendangered species of marine mammals or seabirds. For example, while the Marine Mammal Protection Act (MMPA) and the Migratory Bird Treaty Act (MBTA) explicitly prevent the hunting and taking of marine mammals and seabirds, they are not designed to protect their habitats from potentially adverse uses. This is a particularly significant gap because of the small number of prime habitats remaining in and around the study area.

The California DFG, through the establishment of Ecological Reserves, has the ability to protect exceptional marine habitats in territorial waters. Reserves have been established in relatively small yet sensitive areas off San Miguel, Anacapa, and Santa Barbara Islands. While the Ecological Reserves protect particularly important breeding grounds and haul-out areas, marine mammals and seabirds (and the resources they feed on) are themselves dynamic entities and normally utilize areas much larger than these designated protection zones.

As discussed in section F.1.b., the California DFG has only three boats to enforce all the California Fish and Game regulations applicable to the Channel Islands and along the mainland counties of San Luis Obispo, Santa Barbara, and Ventura. These regulations concern not only Ecological Reserves, but also commercial and sport fishing, endangered species, and migratory birds. Because

of the wide geographic expanse which must be covered and the relatively small enforcement staff at hand to do so, the enforcement capabilities of the DFG appear somewhat strained.

To provide additional enforcement, the National Park Service (NPS) rangers of the Channel Islands National Monument assist the DFG in enforcing California Fish and Game regulations in the waters within 1 nmi (1.8km) of Santa Barbara, Anacapa, and San Miguel Islands. This relationship has been formalized (since 1978) in a cooperative agreement between the DFG and the NPS. However, this additional enforcement assistance is only provided within 1 nmi (1.8km) of the three islands. In addition, NPS enforcement capabilities are also rather limited--seven rangers, one 41-foot patrol boat available for observing all three islands, and one small boat on each island (Johnson, 1979, personal communication). Most of their attention is devoted to the land-based resources of the islands, however.

Vessel traffic and Overflights

Impacts on species and habitat due to vessel traffic, including noise and visual disturbance, propeller hits upon marine mammals, nearshore ballast discharges, groundings, and accidental oil spills, are not at present fully addressed. Among the results of relying on existing management arrangements would be occasional disturbances caused by the vessel presence near sensitive resource areas or their ballasting near rookeries and haul-out areas.

There is no regulation preventing commercial vessels from transiting very nearshore waters where they could cause visual, acoustic, or pollution disturbances to the marine mammals and seabirds.

Compliance with the Traffic Separation Scheme (TSS) has generally been good within the study area (see section E.3.d.). TSS utilization is not mandatory, however, and vessels may navigate around or between the islands.

The present system for regulating the overflight of aircraft does not appear to protect fully nearshore marine mammal and seabird populations. While the existing DFG prohibition on overflights below 1000 feet (305m) over the land areas of Santa Barbara, Anacapa, and San Miguel Islands has lessened visual and acoustic disturbance to island resources, protection does not extend to Santa Cruz and Santa Rosa Island, or the nearshore water habitat of marine mammals and seabirds surrounding the five islands. Persistent low altitude overflights in nearshore waters can severely disrupt various marine mammal and seabird behavior patterns, particularly those of breeding and nesting.

The existing management system does not control the discharges of solid waste from vessels into these waters. Trash and unregulated discharges will probably increase as recreation and other public uses of the area intensify, and could have adverse environmental effects. Furthermore, although EPA is scheduled to promulgate regulations on the discharge of hazardous substances other than oil, such discharges are not now regulated. Existing regulations generally suffice to prevent the contamination of ocean waters by discharges from point sources (which require an NPDES permit), discharges of oil, and ocean dumping, except that it is difficult

to enforce the prohibition on bilge pumping by tankers in this area (Adie, 1979 personal communication).

Petroleum development

The present system for regulating oil and gas activities does make some provision for oil spill prevention, protection of sensitive areas, and preservation of air and water quality. However, given the sensitive nature of the area, this system does not appear to provide an adequate buffer zone where no spills, discharges, or other disturbances associated with hydrocarbon development will originate. In the case of an area with resources as valuable and sensitive as those of these waters, the risks of oil pollution and disturbances associated with oil and gas activities, even if closely regulated, may outweigh the resources to be extracted. The Secretary of the Interior withdrew all tracts subject to Sale #48 within 6 nmi (11.1km) of the northern Channel Islands and Santa Barbara Island (see Figure E-22) from the sale, but these tracts may still be offered in lease sales scheduled for 1982 and 1983 and in possible later sales.

In addition, the USGS's OCS Order #7 (pertaining to pollution prevention and control) and BLM's present stipulations, in tandem, do not require certain oil spill containment equipment onsite (see Section F.2.b.1.). The presence of adequate onsite equipment, in particular a boat to deploy the equipment, is especially important near the islands because of the rather long time required for the local oil spill cooperative (Clean Seas, Inc.) to respond to a spill in the more distant parts of the Channel or on the seaward side of the islands and because of the need to contain spills, if they do occur, before they reach nearshore resources. The California Coastal Commission has required additional contin-

gency equipment on Exxon's tracts 222, 223, 230, 231, 232, and 238 under the Federal consistency provision of the Coastal Zone Management Act. Development proposals are reviewed for Federal consistency on a case-by-case basis, and there are no guarantees that the State will impose the same requirements on all the tracts near the islands.

The protection of sensitive resources from potential impacts of oil and gas development in State waters is also incomplete. State oil and gas sanctuaries prohibiting oil and gas development have been established in State waters around the four northern Channel Islands (San Miguel, Santa Rosa, Santa Cruz, and Anacapa Islands), but not around Santa Barbara Island. Further, even in these prohibited areas, California can allow leasing if development outside the sanctuary would jeopardize the State's economic interests.

Research, and Historic and Cultural Resources

The existing management system has no mechanism to aid in ensuring that the area's research value and potential can be maximized over the long term. While a variety of organizations conduct research in the waters around the northern Channel Islands and Santa Barbara Island, no agency serves to coordinate research projects to insure that regional information needs are addressed in a timely and adequate manner.

Similarly, no agency or group conducts a systematic scientific monitoring program to follow the conditions and fluctuations in population levels of marine birds, fish stocks, or marine mammals, or the water quality in general. The area's potential to serve as

an ecologic baseline indicator of regional environmental quality conditions is underutilized. Thus, an important mechanism for monitoring and evaluating the long-term adequacy of environmental protection efforts and decisions affecting these resources is presently being ignored.

Disturbing underwater archaeological artifacts (see Table E-12) is now prohibited only in the ecological reserves around the San Miguel, Anacapa, and Santa Barbara Islands. Beyond the 1 nmi (1.8KM) boundary of these reserves, as well as around Santa Cruz and Santa Rosa Islands, no regulation currently exists to prevent the disturbance or collection of these resources. Although statutory authority exists for the recognition and protection of underwater historic sites, no sites in the waters around the northern Channel Islands have been nominated to the Federal Register of historic places.

Management

Presently 11 Federal, seven State, and a multitude of regional and local government agencies are vested with some regulatory authority over certain activities within the area. No one entity has management authority to govern resource use and conservation comprehensively. Generally speaking, each has jurisdiction over only a specific resource, region, or activity. Since present arrangements are not responsible for the resource system, they cannot respond to problems which arise in jurisdictional gaps such as the dumping of solid wastes and trash. While the importance of certain resources, such as endangered species, are often well-acknowledged, the present system fails adequately to reflect the national significance and preservation priorities warranted by the total unique marine environment surrounding the northern Channel

Islands region. This failure is especially critical when viewed from the perspective of the need to protect and enhance sensitive natural resources for future generations.

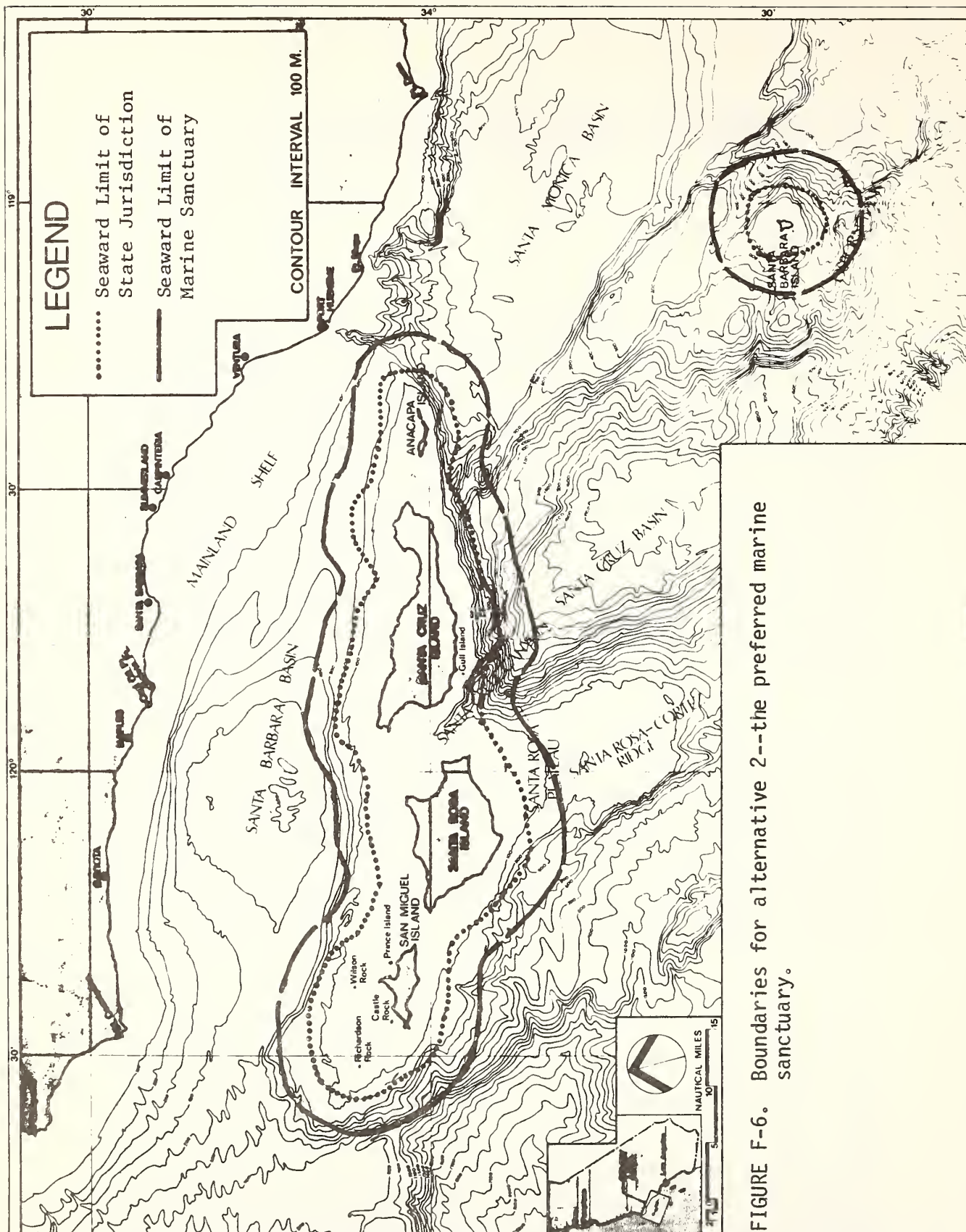
F.2. ALTERNATIVE 2 -- the preferred alternative

a. Introduction

NOAA proposes the designation of a marine sanctuary to preserve the special ecological, conservation, recreational, and aesthetic values of the waters surrounding the northern Channel Islands and Santa Barbara Island. This sanctuary would extend 6 nmi (11.1km) seaward from the mean high watermark of the following islands and offshore rocks: San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock (see Figure F-6). The sanctuary waters would include the entire 3 nmi (5.6km) of California State waters plus an equal distance of Federal waters. The coordinates are set forth in Appendix 1.

This area possesses an exceptionally rich and diverse assemblage of living marine resources and offers a variety of benefits to human users ranging from commercial and recreational fishing opportunities to the less tangible benefits of studying and finding beauty in a relatively unspoiled wilderness area (see, Section E, affected environment).

The 6-nmi (11.1km) boundary includes significant sections of several important resource areas; e.g., Santa Rosa Plateau and Santa Rosa Cortes Ridge North extending south of San Miguel, Santa Rosa, and Santa Cruz Islands, as well as the Santa Cruz-Catalina Ridge which forms an underwater connection between the Anacapa Islands and Santa Barbara Island. This boundary also coincides roughly with the 250-ft. (about 80m) bathymetric contour, and



roughly delineates the island shelf and slope contours. It thereby encompasses the most intense concentration of resources in the area under consideration. As noted in Section E.2, many of the marine mammal, seabird, fish and invertebrate species considered to be important in the ecosystem tend to concentrate in the waters over the shallow island shelves. Populations of certain species (e.g., pinnipeds and birds) are, in fact, among the highest in the world here.

Marine sanctuary designation would allow NOAA to: (1) regulate activities which either pose the risk of causing significant damage or may have greater impacts as use of the area increases; (2) to support research on and monitoring of the resources; (3) enhance public awareness of the value of the area; (4) coordinate potentially conflicting authorities; and (5) respond to currently unforeseen threats which might arise. Formal acknowledgement of the species value of these waters should of itself discourage excessive new development, focus attention on the natural resources of the area under consideration and direct special attention to future development plans.

To protect these resources, NOAA proposes to subject only the following activities to sanctuary regulations:

1. hydrocarbon operations;
2. discharges or deposits of any substance;
3. alteration of or construction on the seabed;
4. vessel navigation and operations (other than fishing and kelp harvesting vessels);
5. overflights below 1000 feet (305m); and

6. removing or harming cultural and historic resources.

The designation specifically excludes the harvesting of living marine resources from the scope of possible sanctuary regulation and leaves various other activities to existing authorities. Permits, licenses, and other authorities applicable in the proposed sanctuary would remain valid unless they would allow an action which violates a marine sanctuary regulation. In order to prevent unnecessary and costly delays, the proposed regulations certify in advance the validity of permits and licenses which do not conflict with marine sanctuary regulations.

b. Regulated Activities

1. Hydrocarbon Operations

(A) Hydrocarbon exploration and exploitation pursuant to any lease executed before the effective date of these regulations and the laying of any pipelines is allowed subject to all regulations, permits, licenses, or other authorizations including those issued by the Department of the Interior, the Coast Guard, the Corps of Engineers, and the Environmental Protection Agency and subject further to the requirement that the following oil spill contingency equipment be available on site: 1) 1500 feet of open ocean containment boom and a boat capable of deploying the boom, 2) one oil skimming device designed for open ocean use, and 3) fifteen bales of oil sorbent material.

(B) Hydrocarbon exploration and exploitation activities pursuant to leases executed on or after the effective date of these regulations are prohibited.

These proposed regulations are designed to protect the sensitive living resources of the northern Channel Islands from threats resulting from oil and gas development by keeping such activities at a minimum within the sanctuary and by requiring protective oil spill containment measures when drilling and other operations proceed. The regulations will reduce the likelihood of resource degradation due to: (1) the effects of oil spills; (2) noise and visual disturbances caused by drilling, presence of drill rigs or platforms, work crews, supply boats, and helicopters; and (3) pollution associated with aquatic (and aerial) discharges. Table F-4 summarizes the hazards to marine mammals, seabirds, and marine organisms which may result from offshore oil and gas development; Table F-5 describes how NOAA's sanctuary provisions will help mitigate these impacts. This section addresses the impacts listed above, tells how NOAA's sanctuary provisions will relieve the environmental stress, and describes the projected socioeconomic effects of these regulations.

It should be clearly noted at the outset that the present level of oil and gas activity within or adjacent to the 6-nmi (11.1km) proposed sanctuary is minimal. As discussed previously and as illustrated in Figures F-7 and F-8, all tracts within 6 nmi (11.1km) of the northern Channel Islands were withdrawn from Sale #48. Because this tract withdrawal does not apply to future sales, NOAA proposes to prohibit all future hydrocarbon activities on these tracts. In addition, as Figures F-7 and F-8 show, 19 other previously leased tracts, particularly off San Miguel Island, have expired or been terminated. Thus, there are only 15 active leases fully or partially within the 6 nmi (11.1km) boundary: 202, 203, 204, 205, 210 (off Anacapa island); 222 and 223 off Santa Cruz Island; 243-247 (off the south side of Santa Rosa Island); and 289-291 (off Santa Barbara Island). No development activity at all (including exploratory drilling) has occurred on

TABLE F-4. Summary of potential hazards to marine mammals, seabirds, and marine organisms resulting from offshore oil resource development and production (modified from University of California, Santa Cruz, 1976).

Activity or Facility	Chronic Hazards	Episodic/Catastrophic Events
<u>Exploration</u> Seismic Profiling Drilling Boat traffic	Noise, "startle" effects Prop hits	Subsurface noise - Concussion Siltation Turbidity increase
<u>Operation</u> <u>Offshore facilities</u> Production platforms Well-head Support Crew and supply boats Aircraft	Intrusion Leakage/seepage Sub-surface noise and propeller hits Noise in air	Blowout
<u>Transport</u> Pipelines Pumping buoys Barges and Tankers	Leakage Leakage Bilge Oil Intrusion	Rupture Collision or grounding
<u>Clean-up</u> Oil on water Skimmers Burn-off Chemicals Grounded oil Booms Straw Chemicals Presence of crew and equipment	Intrusion Toxicity of chemical dispersants	Boat activity Pollution--air Pollution--water Pollution--sediments Disturbance to sensitive bird and mammal populations on islands by human intrusion and aircraft activity Habitat destruction

Table F-5. Potential oil and gas development impacts mitigated by NOAA's preferred sanctuary alternative

REGULATION	REASON FOR MITIGATION OF IMPACT
1. No future leasing within 6 nmi (11.1km) of northern Channel Islands and Santa Barbara Island	<p>--Creates a buffer area providing increased response time for oil spill cleanup efforts;</p> <p>--Increases the distance between potential spill/pollutant discharge point (i.e., rigs and platforms) and sensitive resource areas thereby allowing for weathering and dilution of contaminants before reaching important marine life concentration areas;</p> <p>--Provides a buffer between noise and visual disturbances and important marine life habitats;</p> <p>--Reduces congestion by additional supply vessels which would otherwise frequent nearshore areas;</p> <p>--Reduces potential visual intrusion on aesthetic values of the National Monument, the proposed marine sanctuary, and the proposed National Park;</p> <p>--Reduces potential air pollution;</p>
2. Requirement of additional onsite oil spill containment equipment on existing leases	<p>--Increases the probability that, if a spill occurs, it can be reached and controlled before drifting to sensitive breeding ground and nesting areas.</p>

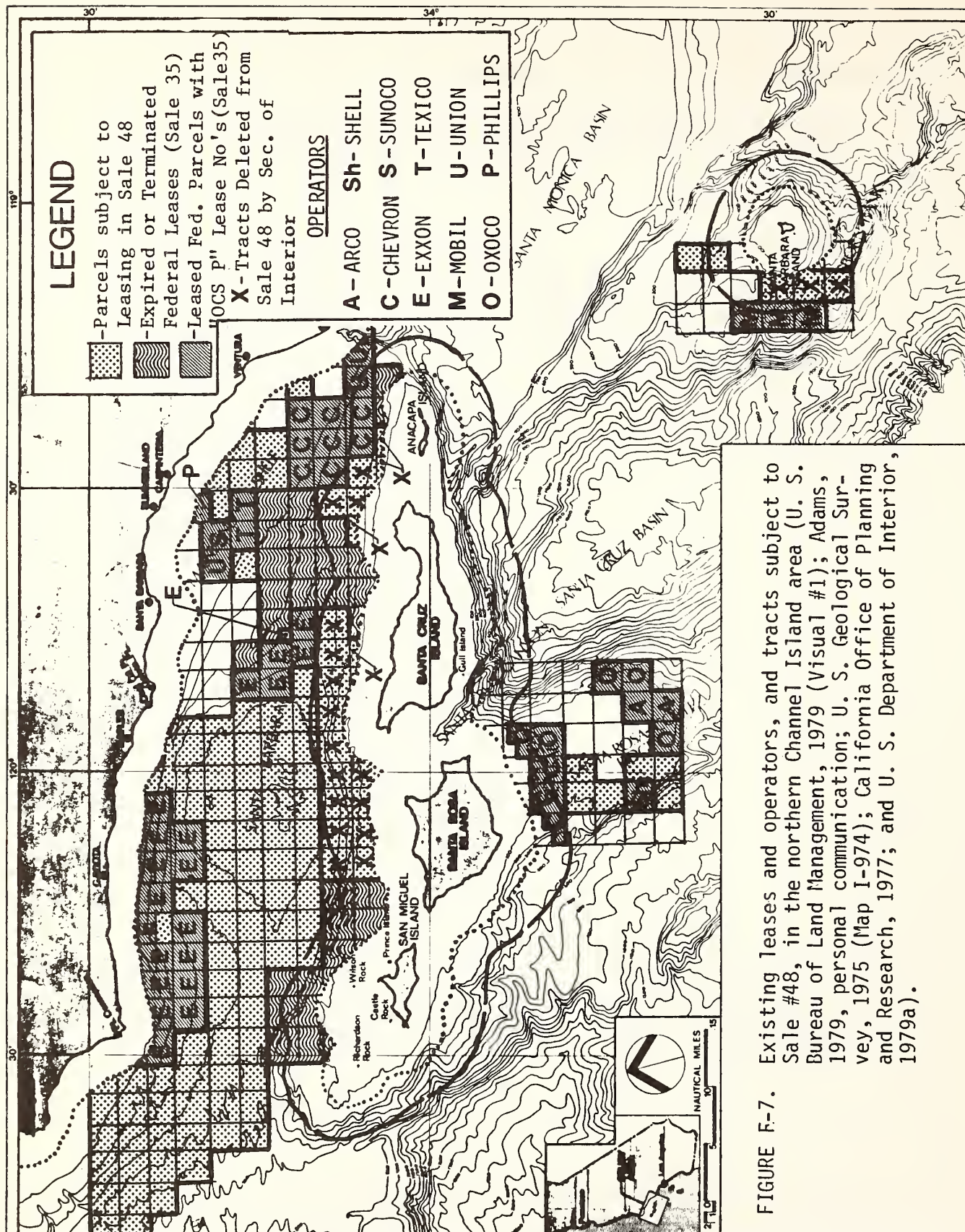


FIGURE F-7. Existing leases and operators, and tracts subject to Sale #48, in the northern Channel Island area (U. S. Bureau of Land Management, 1979 (Visual #1); Adams, 1979, personal communication; U. S. Geological Survey, 1975 (Map I-974); California Office of Planning and Research, 1977; and U. S. Department of Interior, 1979a).

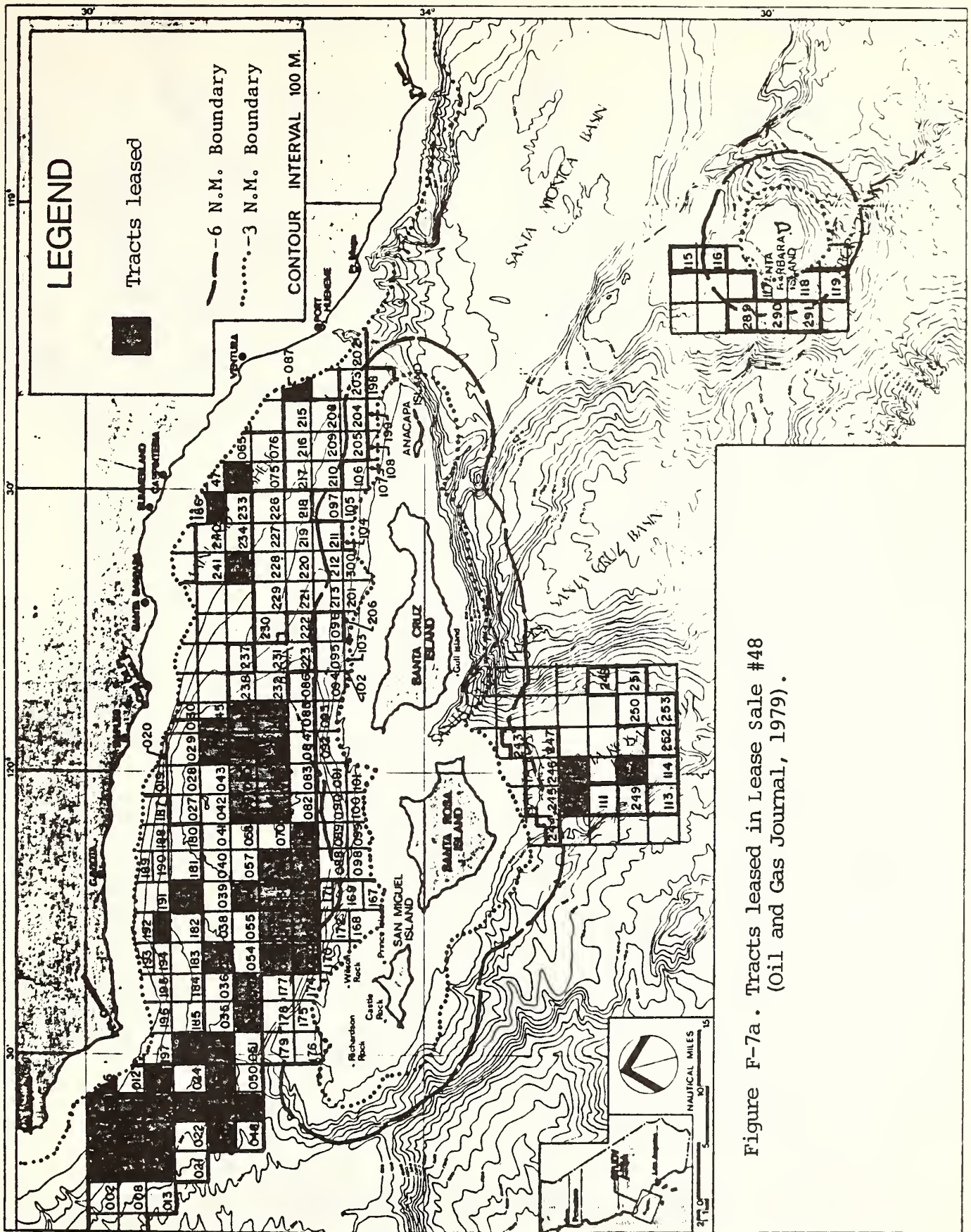
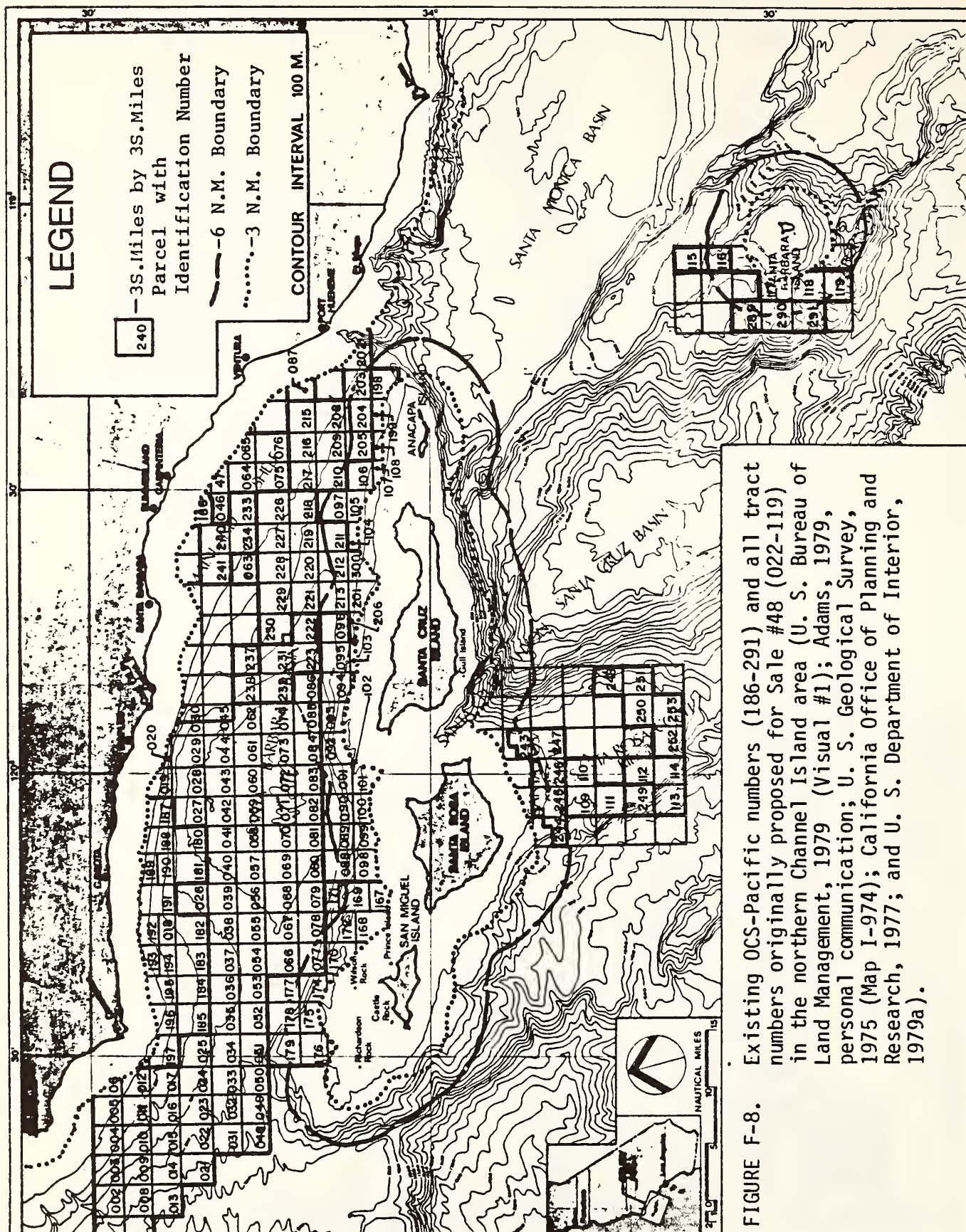


Figure F-7a. Tracts leased in Lease sale #48 (Oil and Gas Journal, 1979).



the tracts south of Santa Rosa Island, and only one exploratory well (with no discovery) has been drilled in the tracts off Santa Barbara Island (Adams, 1979, personal communication; see Table E-16, Section E.3.b). Thus, because levels of oil and gas development activity within 6 nmi (11.1km) of the islands have so far been relatively low, the area's pristine character has been well preserved. While it does not affect future activities on existing leases the sanctuary's prohibition of operations on leases executed on or after formal designation will keep down the level of oil and gas development nearby and thus enhance long-term resource protection.

Threats to Resources

--Oil Spills

Oil can directly affect living marine organisms biochemically or physically (see, for instance, Boesch et al., 1973; National Academy of Sciences, 1975; and U. S. Bureau of Land Management, 1975 and 1979). Petroleum hydrocarbons can also have sublethal or indirectly lethal effects on marine organisms through the destruction or reduction of a species' food supply, chemical interference with reproductive success, and synergistic effects which may reduce resistance to disease and other stresses which alter behavioral patterns such as feeding.

The physical damage that can be caused by oil coating marine organisms, the feathers of seabirds, the fur of marine mammals, and the respiratory apparatus of fish is well documented (see, for instance, BLM, 1979). With the exceptional abundance of marine mammals and seabirds -- both of which may be seasonally present

around the Channel Islands in numbers representing a significant percentage of the entire species population (as discussed in Sections E.2.a and b) -- the possibility exists that the harm to pinniped and seabird populations would be magnified if an oil spill were to coincide with a concentration period (U. S. Bureau of Land Management, 1979).

--Pinnipeds

Floating oil may adversely affect pinnipeds in four ways: by fouling the fur and through ingestion, inhalation, and the irritation of eyes and membranes (U. S. Bureau of Land Management, 1979). Oil contamination of fur can cause two very important physiological changes -- loss of buoyancy and impairment of normal thermal resistance. Of the two, impairment of the body insulation properties is probably the more damaging, particularly for fur seals which depend primarily on their fur for insulation (U. S. Bureau of Land Management, 1979).

Two species of fur seals are found in the proposed sanctuary, the northern fur seal and the Guadalupe fur seal, which has been proposed for listing as an endangered species. Both seals are at the limit of their range at the northern Channel Islands which may render them even more susceptible to stress. The sea otter, an occasional transient in the area, is perhaps the most vulnerable marine mammal to oil contamination (Davis, 1978; Kooyman and Costa, 1978, U. S. Bureau of Land Management, 1979).

The only major oil spill occurring in the study area was the 1969 Santa Barbara blowout. Estimates of the damage to biological communities vary from essentially no damage to intertidal areas to 100 percent mortality to certain organisms and plants at some locations. All observers reported high mortality for birds (U. S. Bureau of Land Management, 1979).

The long-term effects of the 1969 Santa Barbara oil spill on marine mammals are also still unclear. Shortly after the spill, biologists surveyed the percentage of mortality and of oil contamination among the northern elephant seal and California sea lion pups and tagged both oily and clean living pups (U. S. Bureau of Land Management, 1979). While significantly more oiled than "clean" California sea lion pups were found dead, the evidence did not prove a cause and effect relationship. Although the spill occurred soon after the breeding season for northern elephant seals, the pups had already been weaned and they did not ingest oil from their mothers. Tag returns for this species showed that oily pups survived as well as clean pups. An earlier spill could have had far more severe impacts (U. S. Bureau of Land Management, 1979).

Several other circumstances of the spill may have also mitigated the effects on biological resources. Most of the oil did not reach shore until at least 3 days after the spill, thus allowing time for weathering; favorable winds, kelp beds, and a natural current barrier may have prevented much of the oil from reaching shore; and the heavy rains of that year increased sedimentation and flotsam in the area, which may have acted as sinking and absorbent agents for the oil (U. S. Bureau of Land Management, 1979).

An oil spill in the sanctuary area would probably cause most damage to pinniped populations if it occurred during the breeding season (U. S. Bureau of Land Management, 1979). For San Miguel Island, this would be from March to August and from December to February (see Table E-4). On Santa Rosa and Santa Cruz Islands, the only species with rookeries are harbor seals; the greatest effects of a spill would be between March and May. On Santa Barbara Island, the breeding season extends from June to August and from December to February (U. S. Bureau of Land Management, 1979).

--Cetaceans

Although the impacts of oil on cetaceans are not well understood, some scientists believe that they may have both short and long-term detrimental effects (Leatherwood, 1979, personal communication). Because baleen whales (Mysticeti) are filter feeders, for example, they are susceptible to direct ingestion of oil or oily substances. The toothed whales (Odontoceti), on the other hand, would be more indirectly affected by eating organisms further down the food chain, such as cephalopods and fish. Of concern is the fact that this could trigger a magnification effect where toxic oil might build up to high levels in the top carnivores; however, such effects have not yet been demonstrated.

It is not known whether whales will swim through or around an oil slick. Humpback whales have been seen feeding in an oil slick in the northern Atlantic Ocean without apparent immediate ill effects (National Oceanic and Atmospheric Administration, 1979). Although the cumulative effects of oil on whales are not known, it is

likely that it would, at least, irritate their eyes and could possibly affect their breathing apparatus given prolonged exposure. Because whales depend on blubber rather than fur for thermal regulation, however, oil would not affect their ability to withstand cold Pacific waters. Mammal reactions to an oil spill would depend on many variables including the species of whale, condition of the whale, time of year, and severity of the oil spill.

In addition to the traditional presence of migrating gray whales within, or at least quite close to the preferred sanctuary's 6 nmi (11.1 km) boundary, and occasional sightings of other whales and porpoise species in island waters (see Section E-2.a.1, Table E-5), numerous cetacean populations could be detrimentally affected depending on the circumstances.

Floating oil affects marine birds by fouling feathers and through ingestion, inhalation, and irritation of eyes and membranes. Feather contamination is the primary cause of immediate mortality because of the resulting inability to fly, avoid predators, or forage under water as well as the lowering of body temperature due to loss of insulation. Birds may also ingest oil while preening or grooming contaminated feathers, which can lead to death (U.S. Bureau of Land Management, 1979).

A number of factors influence the vulnerability of different species of birds to contact with spilled oil. Species which have a tendency to form large, dense flocks on the water, spend considerable time swimming on the water, dive when alarmed, or exist in small, isolated populations are especially vulnerable (U. S. Bureau of Land Management, 1979). To some extent, all seabirds which breed in large colonies are vulnerable to contact with

floating oil during nesting season.

The study area is characterized by a number of seabird breeding colonies (see Section E.2.b. and Table E-10 above). In addition, many migrating species congregate in the offshore region for brief periods throughout the year. Potential degradation threats endangering seabirds due to oil spills and associated clean up operations are likely to be particularly severe from January to June when seabird densities are at their highest (U. S. Bureau of Land Management, 1979). Both cormorants and alcids are particularly susceptible to exposure in this respect largely on account of their sizeable breeding colonies within the study area. Brown pelicans, while present in far smaller populations here, are equally vulnerable due to their restricted area distribution, seasonally large breeding assemblages, and frequent diving (U. S. Bureau of Land Management, 1979).

Among the other seabirds generally believed to be the most susceptible to oil contamination are: murre, guillemots, auklets, murrelets, puffins, loons, grebes, and scoters (U. S. Bureau of Land Management, 1979). According to an analysis of impacts resulting from the 1969 Santa Barbara oil spill, the western grebe was apparently incapable of discriminating between oiled and clean water surfaces and thus was the one species most seriously affected by oiling (Battelle-Northwest, 1969). Shearwaters, albatrosses, petrels, gulls, terns, shorebirds, and some ducks and geese all demonstrate vulnerability to oil contamination, but less so than diver species (U.S. Bureau of Land Management, 1979) (see Table F-6).

Table F-6. Seabird species most vulnerable to impacts related to OCS oil resource exploitation. (All populations are considered vulnerable to disruption of feeding grounds wherever they aggregate in large numbers. Birds are protected under the Migratory Bird Treaty Act.) (University of California, Santa Cruz, 1978).

SPECIES	COMMENTS
Migratory waterfowl (loons, grebes, sea ducks)	Most are divers and are very susceptible to oiling of feathers; many species forage in large groups in restricted areas of shallow water nearshore.
Cormorants	Breeders in Channel Islands; very susceptible to disturbance of colonies; roost ashore in large groups and forage in flocks; susceptible to oiling of feathers.
Brown pelican	Endangered species and Channel Islands breeder; very susceptible to disturbance of colonies;
Phalaropes	Very numerous and wide-ranging but susceptible to oiling of feathers.
Western gull	Channel Islands breeder; may contaminate eggs by bringing oil to nests on breast feathers.
Nesting alcids (Cassin's auklet, pigeon guillemot, Xantus' murrelet)	Very susceptible to oiling of feathers; gather in large groups near colonies; vulnerable to disturbance of colonies and introduction of terrestrial predators.
Wintering alcids	Very susceptible to oiling of feathers; may concentrate in restricted offshore areas for feeding.

The long-term, cumulative effects of oil and gas development on seabird habitat areas and foraging grounds in the Santa Barbara Channel area are still unknown (U. S. Bureau of Land Management, 1979). Because of their direct dependence on nearshore food sources, long-term contamination of foraging grounds could cause major alterations in seabird reproductive capabilities (U. S. Bureau of Land Management, 1979).

Oil spill treatment and clean-up operations also have important impacts on the seabirds and mammals. Often the emulsifiers used and associated human activity have been more harmful than the oil (U. S. Bureau of Land Management, 1979). Because many new generation dispersants which are supposed to be no more toxic than oil have not yet been totally evaluated, their environmental effects remain largely unknown (U. S. Bureau of Land Management, 1979). As with oil spills themselves, the impacts of cleanup operations would be particularly severe at times when seabirds are highly concentrated.

--Fishery

A large oil spill in a fishing area also poses a serious threat to sport and commercial fisheries such as those encompassed by the preferred sanctuary alternative (see Section E.2.c). Potential long-term effects include not only injury to the generally more sensitive larvae and juveniles but also to adults, altered reproduction (fish egg viability or sperm-egg interaction) or behavior (feeding or migration), or disruption of the food chain. The precise type of impact depends largely on timing with respect to spawning season, migration patterns, and whether the oil sinks

(i.e., affects bottom or demersal eggs) or floats (i.e., affects pelagic eggs). A spill resulting in a surface slick could affect upper water biota such as the squid, northern anchovy, jack mackerel, and the planktonic base of the food chain. Heavier oils that sink could affect shellfish (abalone, lobster, crabs) and fishes such as the flounders and soles.

A spill could prevent or limit fishing for a period of time during and after its occurrence. In the case of the Santa Barbara spill in 1969, it is estimated that fishermen lost a minimum of two months of fishing with the area displaced by the spill (Neal and Sorenson, 1970; U. S. Bureau of Land Management, 1979). The chemical remains of spills in other sectors of the world's oceans, some of which are similar to portions of the marine sanctuary study area, have closed waters to fishing or other activities for many years (e.g., Hyland, 1977).

The effects of oil and gas activities on kelp, particularly in terms of kelp's role as a habitat for fish, are also important. A number of kelp bed concentrations are evident around each of the Northern Channel Islands (see Section E.2.c and Table E-14). It is generally believed that the susceptibility of kelp and other plants to oil pollution varies with its life stage and that the adult generation has an outer mucilage covering which appears to protect it against oil toxicity (U. S. Bureau of Land Management, 1979). While there appears to be little evidence to indicate that kelp is harmed by oil, it is an important habitat for fish and fauna which may ingest or come into contact with oil trapped in its fronds. In addition, kelp contamination due to oil (e.g., natural seepage) renders it unfit for human harvest unless sufficient wave action cleansing occurs (Szelenyi, 1979, personal communication).

--Reduced risks from spills

Sources of oil spills include: (1) blowouts and other accidents at platforms; (2) pipeline ruptures; (3) tanker accidents and discharges; and (4) discharges during operation. The potential for major platform spills, especially from a blowout, is greatest during drilling operations. A blowout occurs when a well is drilled into a zone of unexpected high pressure and rig/platform safeguards cannot prevent oil from escaping to the surface. Major spills can also occur at platforms as a result of fires, explosions, vessel collisions, or other accidents. Once production has begun at a platform, minor spills can occur at any time.

Pipeline accidents -- leaks, ruptures, etc. -- can result in minor or major spills, although most pipeline spills have been very small (California Office of Planning and Research, 1977). Spills may also result from accidents involving tankers carrying petroleum into southern California ports (see Section E.3.d), the transfer of oil from a production platform to a tanker (as Exxon has proposed to do with its initial Santa Inez Unit production), between tankers (for lightering from very large crude carriers to shallow-draft tankers capable of entering California ports), or between tankers and terminals.

Based upon existing knowledge concerning trajectories of oil spilled at sites near and in the proposed sanctuary, the prohibition of hydrocarbon activities within 6 nmi (11.1km) of the islands will substantially reduce the risk to the sensitive resources therein, both by preventing some spills and providing a temporal and spatial buffer.

Immediately following a spill, the oil undergoes rapid weathering and most of the toxic fractions evaporate into the atmosphere or disperse into the water. Given the opportunity for such dilution and chemical/biological degradation, damage from oil spills can be minimized. It is, therefore, important to note that the greater the distance between significant resources and potential oil spill sites, the greater the amount of time available for spills to be diluted and weathered to a less toxic concentration or form.

The Bureau of Land Management developed oil spill probabilities for leases predating and included in Lease Sale 48 and an oil spill model to plot trajectories of hypothetical spills. Table F-7 illustrates the probability of an oil spill (1000 barrels or more) reaching the five islands as a result of activities associated with all the tracts considered for Lease Sale 48 as well as with tracts from earlier sales premised on BLM's oil spill model and probabilities. Figure F-9 shows oil spill trajectories computed by the California Office of Planning and Research (1977). In the Final Environmental Statement of Sale 48 (U. S. Bureau of Land Management, 1979), BLM finds that "(i)f just San Miguel Island, as the major pinniped breeding island is considered, the probability of a major spill within the next 20 years is almost 100 percent."

As noted in Section E.3.b. and below, BLM's oil spill probabilities reflect development scenarios analyzed in the Final Environmental Impact Statement on Sale 48 (U. S. Bureau of Land Management, 1979). Since then, the Secretary of Interior withdrew 69 tracts from Sale 48, including 24 near the northern Channel Islands and Santa Barbara Island (Figure F-7). Although the oil spill model was not rerun to reflect changes in oil spill probabi-

TABLE F-7. Probability of contact by one or more 1000 BBL spills between 1979 and 2000*.
(U. S. Bureau of Land Management, 1978b.)

Island	3 Days***			10 Days			30 Days			60 Days		
	P	E	B	P	E	B	P	E	B	P	E	B
San Migue1	6%	6%	12%	11%	18%	27%	14%	23%	34%	14%	25%	36%
Santa Rosa	10	20	27	15	33	44	18	37	48	19	38	50
Santa Cruz	37	53	71	50	71	86	53	75	88	53	75	88
Anacapa	12	25	34	20	40	52	23	43	56	23	44	56
Santa Barbara	<0.5	<0.5	1	2	4	6	4	8	12	5	9	14

P = Proposed Leases; **E = Existing Leases; B = Both

*These probabilities are based on USGS's original resource estimates which have subsequently been reduced by 84%.

**Proposed leases represent those analyzed in Final Environmental Statement on Sale 48 (U.S. Bureau of Land Management, 1979). Sixty-nine of these tracts, including 24 near the northern Channel Islands, were withdrawn from Sale #48.

***Days - time from release of spill to contact with Islands.

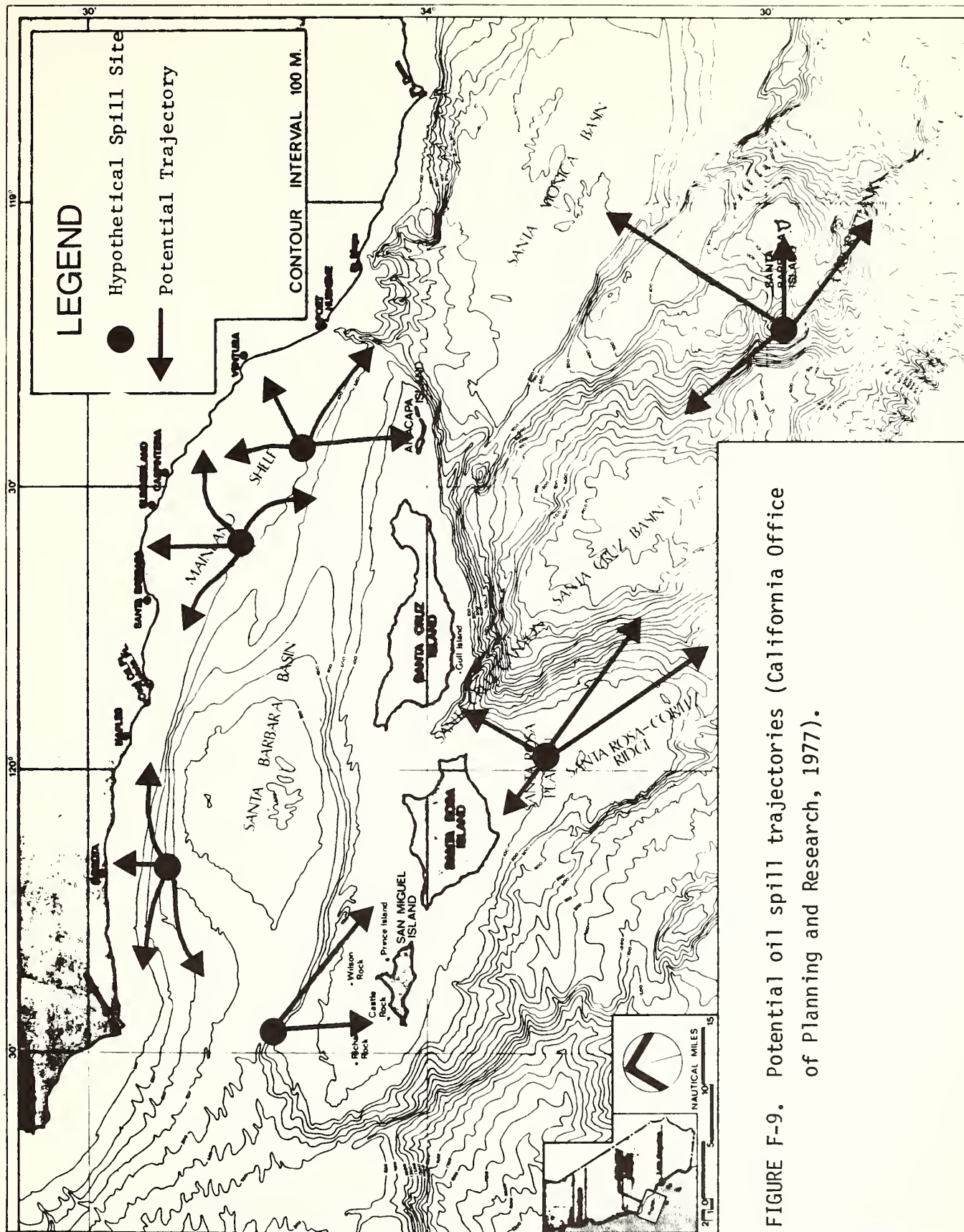


FIGURE F-9. Potential oil spill trajectories (California Office of Planning and Research, 1977).

lities because of these tract withdrawals, the probability of an oil spill reaching the Channel Islands has certainly been reduced. Spills can still result from operations on existing leases in the area and, potentially, from Sale 48 tracts beyond 6 nmi (11.1km). In addition, although the tracts closest to the islands have been withdrawn from Sale 48, without sanctuary designation they can still be leased in subsequent sales.

In addition to showing the probability that an oil spill will reach the islands, BLM's oil spill model also developed probabilities that an oil spill will affect: (1) major pinniped haulout and breeding areas and (2) seabird breeding and nesting areas within three days; these are shown on Table F-8*. For instance, probabilities of a spill reaching major pinniped haulout and pupping areas from a proposed lease within the proposed sanctuary (see P9 on Figure F-10) north of Santa Cruz and Anacapa Islands (for Lease Sale 48 which was later withdrawn) within three days range as high as 63 percent. Probabilities range as high as 68 percent that spills occurring on a proposed lease (P9) and 70 percent from existing leases (see E5 on Figure F-11) will reach seabird breeding and nesting areas. These probability figures do not reflect the fact that a significant impact could also occur at sea (i.e., not just to haulout and nesting sites) because of the intensive use of these areas as foraging grounds.

*The probabilities that a hypothetical spill will affect pinniped and seabird areas are not specific to the Channel Islands, but reflect areas throughout the Southern California Bight. BLM's resource maps used for this analysis do illustrate a very high correlation between location of these areas on the Channel Islands and their areal extent throughout the Bight.

TABLE F-8. Probabilities (in percent) that an oil spill starting at a particular location in the vicinity of the northern Channel Islands will reach in three days: (1) major pinniped haul-out and breeding areas and (2) seabird breeding and nesting areas (U. S. Bureau of Land Management, 1978b).

Hypothetical Spill location* (see Figure F-10 and F-11)	Major Pinniped Haul-out and Breeding Areas**	Seabird Breeding and Nesting Sites**
(Proposed Leases)		
P ₁	13	26
P ₂	8	46
P ₃	26	28
P ₄	4	7
P ₅	30	13
P ₆	10	17
P _{7***}	11	17
P ₈	16	14
P _{9***}	63	68
P ₁₀	3	3
P ₁₁	13	24
P _{12***}	22	52
(Existing Leases)		
E ₁	10	10
E ₂	8	46
E ₃	23	40
E ₄	34	35
E ₅	55	70
E ₆	49	52
E ₇	2	2
E ₈	2	3
E ₉	18	37

* See Figures F-10 and F-11 for hypothetical spill locations and their proximity to San Miguel, Santa Cruz, Anacapa, and Santa Barbara Islands. "P" stands for Proposed Sale 48 Leases and "E" for Existing Leases. BLM's Oil Spill Model also includes probabilities for spills from tankers hitting these resources.

** As noted, BLM's Oil Spill Model does not consider the probabilities of an oil spill on these areas specifically at the northern Channel Islands and Santa Barbara Island, but rather throughout the Southern California Bight.

*** P₇, P₉, and P₁₂ correlate with the 24 tracts around the islands withdrawn from Sale 48.

n - less than 0.5 percent.

TABLE F-9. Oil spill recovery equipment in the vicinity of the northern Channel Islands--see Figure F-17 (U. S. Bureau of Land Management, 1979).

<u>Location on Figure F-13</u>	<u>Equipment available at location</u>
A	<u>Clean Seas</u> Getty Oil Terminal 1 trailer 1 51 T ACME Skimmer 800' of 16" Sea curtain boom
B	<u>Clean Seas</u> 3 Exxon Floating Weir skimmers 1 Komara Mini Skimmer 1 050 Cyclonet Skimmer 800' of 8" Sea curtain boom 400' of 16" Sea curtain boom 1,210' of Sea Sentry boom 2,000' of 8-T boom 1 Vicoma sea pack (1,600' of boom) 1 trailer 1 39 T ACME Skimmer 1,500' of 43" Expandi boom 800' of 8" Sea curtain boom
C	<u>Clean Seas</u> Carpinteria yard 1 trailer 1 51 T ACME Skimmer 800' of 16" Sea curtain boom 400' of 8" Sea curtain boom
D	- <u>Clean Seas</u> Union Terminal 1 trailer 1 51 T ACME Skimmer 4,400' of 43" Expandi boom 738' of 30" Expandi boom
E	<u>Clean Seas</u> 1 trailer 1 51 T ACME Skimmer 2,410' of 30" Expandi boom

NOTE:

At each drilling location there is a minimum of 1 skimmer, 1,000' of boom and 10 bbls of dispersant.

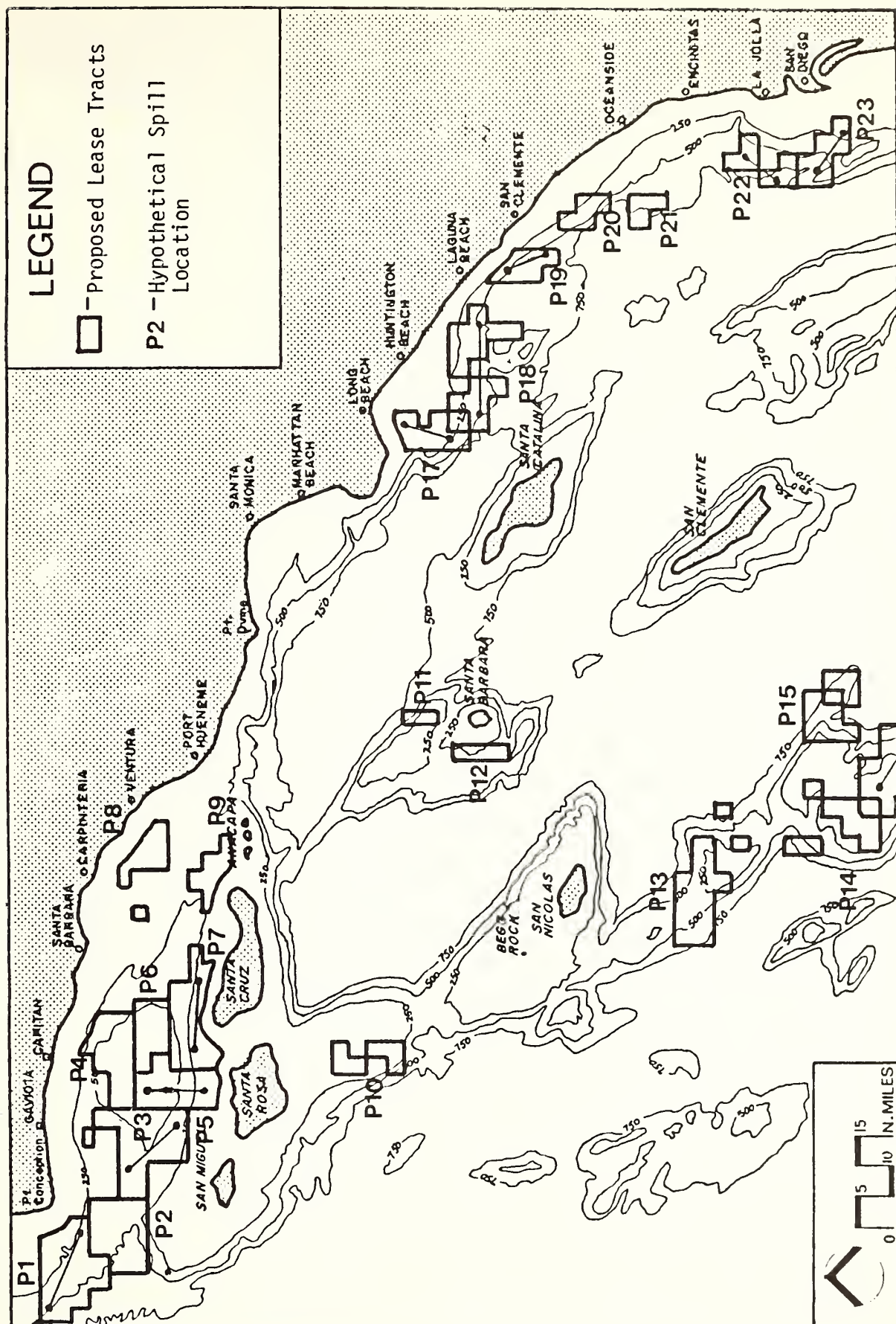


FIGURE F-10. Hypothetical spill locations from proposed Sale #48 (U. S. Bureau of Land Management, 1978b).

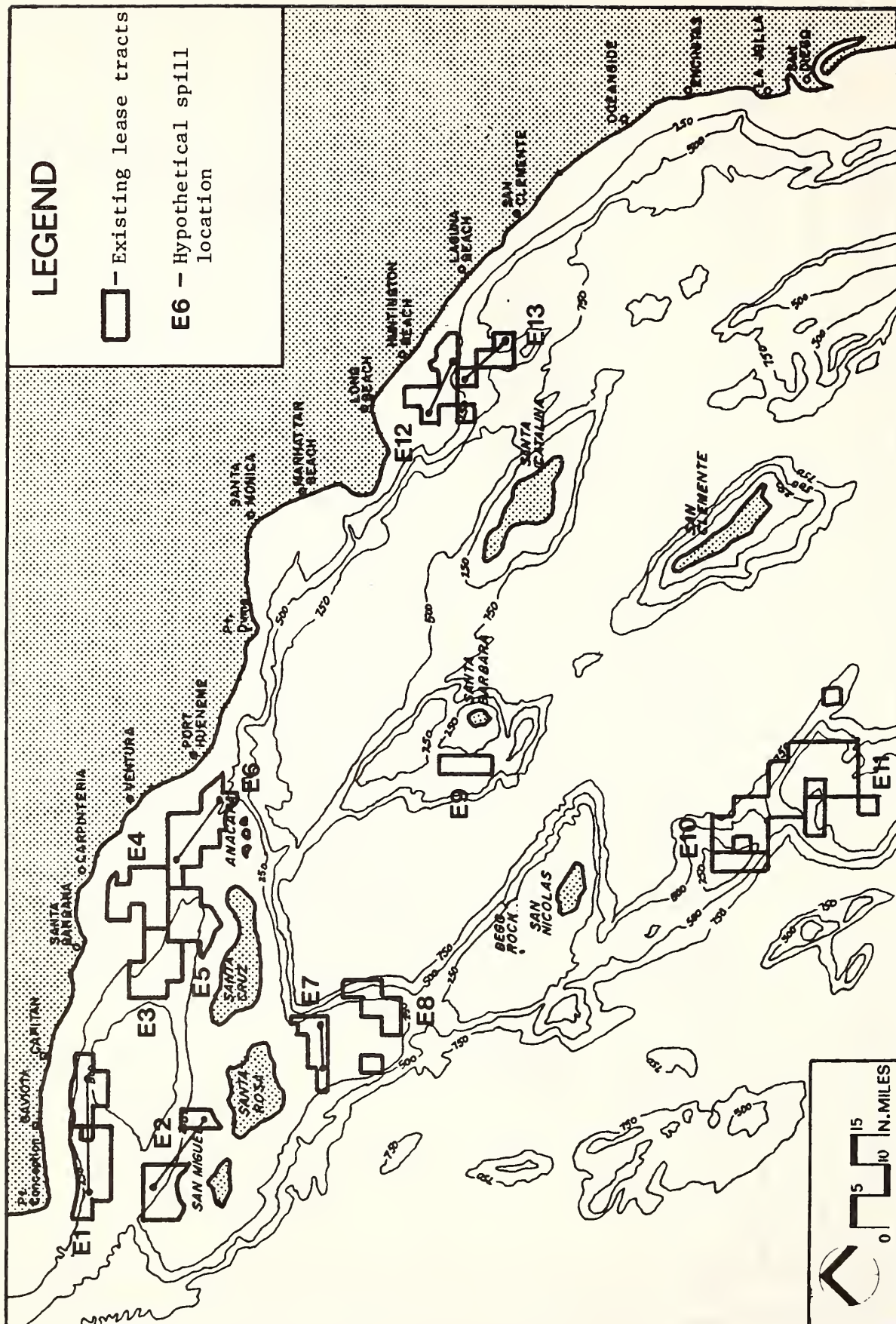


FIGURE F-11. Hypothetical spill locations from existing leases (U. S. Bureau of Land Management, 1978b).

Because BLM's oil spill model has not been rerun in light of recent tract withdrawals (a total of 24 tracts) around the Islands or the USGS's reduction in estimated resource potential available from Sale 48 (see Table E-13), it is difficult to determine the specific additional protection from oil spills (i.e., a reduction in the probability of a spill hitting an island resources) provided by the 6-nmi (11.1km) buffer. By deleting the hypothetical spill locations which correlate with the 24 tracts withdrawn from Sale 48 (see P7, P9, and P12 on Figure F-12), the cumulative probabilities are reduced, but individual probabilities from hypothetical spill sites are still relatively high (see Table F-8). The high probability of a spill originating from tracts within the proposed sanctuary deleted from Lease Sale 48 (p7, p9, and p12) affecting pinnipeds and seabirds illustrates the need to remove permanently these tracts from any future lease sales (see Table F-8).

The 6 nmi (11.1km) buffer created by NOAA's proposed regulations is necessary because oil spill containment measures do not suffice to protect the resources of these waters from the risks of an oil spill in this area. The success or failure of at-sea containment and recovery operations in the event of an oil spill depends heavily on three factors: prevailing marine conditions, the amount of time available before the oil will reach critical resources, and speed of response.

Under calm ocean conditions, existing containment and recovery equipment will function effectively, making successful at-sea recovery of the spilled oil more likely. But the effectiveness of containment booms and skimmers falls off dramatically as wave heights or wind velocities increase; the booms will not function

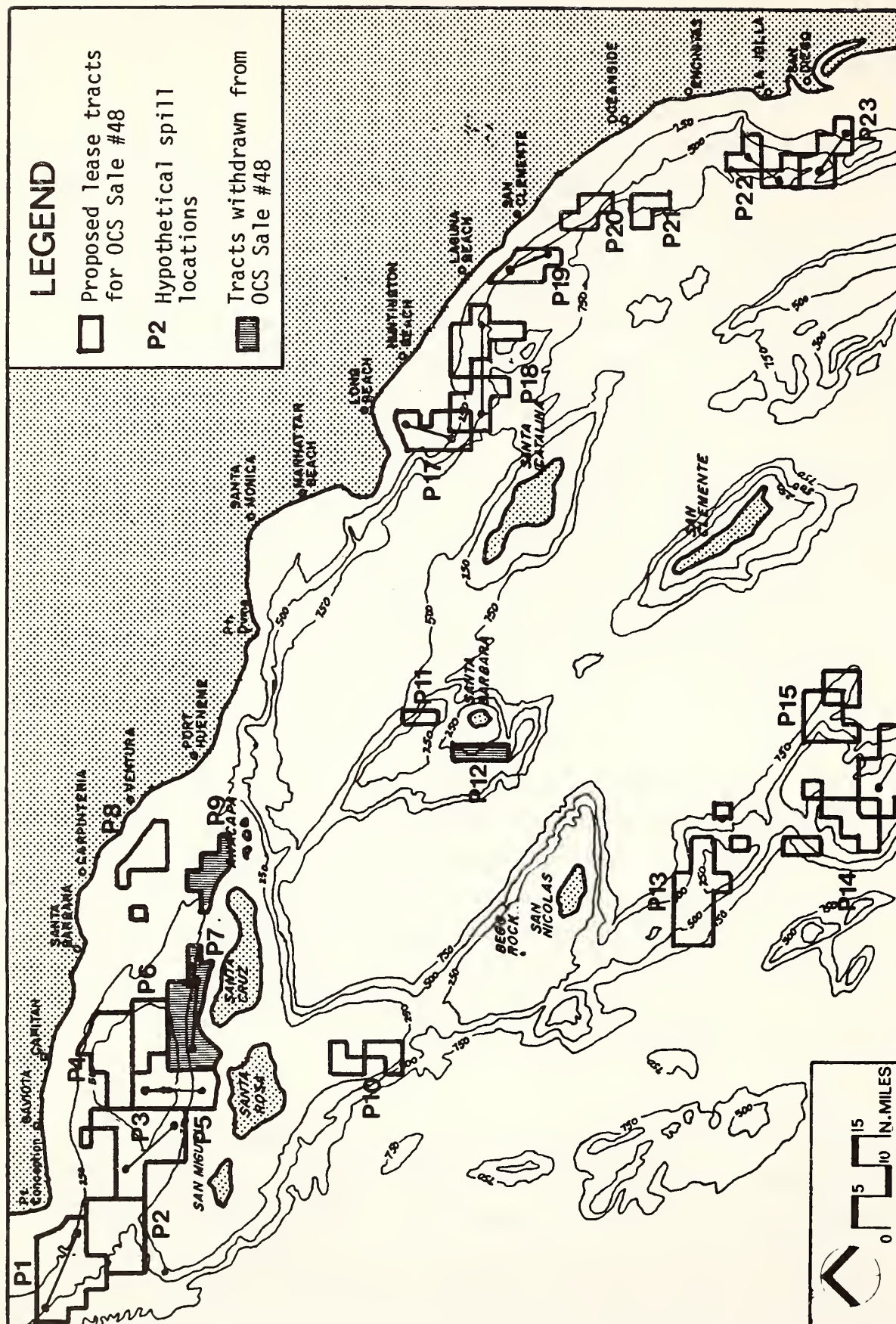


FIGURE F-12. Hypothetical spill locations which correlate with tracts withdrawn from Sale #48 (U. S. Bureau of Land Management, 1978b; U. S. Department of Interior, 1979a).

effectively if water currents exceed one to two knots (California Office of Planning and Research, 1977). Wave period, height, and the amount of turbulence also affect performance. Skimming devices are, likewise, dependent on sea conditions. Effective skimming is unlikely when ocean conditions are not at least moderately calm (California Office of Planning and Research, 1977).

The exposure of the waters seaward of the Channel Islands to currents from the south and north and to storm swells makes sea states too rough during most periods for effective at-sea spill containment. Similarly, the seas around San Miguel Island are typically very rough and would often preclude effective containment. For instance, Clean Sea, Inc. (no date), in its site protection and cleanup plan, states that the convergence of ocean and Channel currents at the easternmost tip of San Miguel Island results in breakers and rough seas. Access or approach for spill control in that region is extremely dangerous (Clean Seas, Inc., n.d.). Waters within the Santa Barbara Channel are more protected from offshore swells and storms, particularly in the eastern portion of the Channel. Chevron (1978) noted that average significant wave heights in the eastern portion of the Channel are less than 6 feet (1.8m) and that severe storm waves (100-year maximum) have a 95 percent probability of not exceeding 34.4 feet (10.5m) in height. Such currents and winds can still, however, make the waters rough and limit the effectiveness of oil spill containment equipment. Because of rough water conditions around the islands, even the availability of onsite containment equipment may not insure that spills are effectively recovered.

Because the tracts in the sanctuary are far from the mainland where Clean Seas' oil spill response equipment is located (see Figure F-13), in the event of an oil spill it is important that there be sufficient time for Clean Seas to reach the site. NOAA's prohibition on oil and gas operations within 6 nmi (11.1km) of the islands on future leases extends the response time available for possible at-sea oil spill cleanup before the spill reaches nearshore areas. This increase in response time is particularly important because, if a spill does reach shore, it is likely that cleanup crew, equipment, and associated disturbances will greatly compound the impact caused by the spill itself (U. S. Bureau of Land Management, 1979). For instance, Lindstet-Siva (1976) stated that attempts to boom rookery beaches may be counterproductive since most species of pinnipeds will abandon rookeries if repeatedly disturbed. Because suitable areas for pinniped rookeries are quite limited, abandonment of a rookery in this area could have severe consequences. Even if disturbed only once, several days may be required before activity patterns return to normal on a disturbed beach. Because of these factors, Lindstet-Siva (1976) noted that the best action is to mechanically contain the oil at the site. If oil reaches rookeries, it is probably best not to attempt cleanup since almost any method would be disturbing to these animals.

In their site protection and cleanup plans, Clean Seas, Inc. recognize the potential that oil spill recovery activities may disrupt pinniped rookeries (Clean Seas, Inc., no date). The site protection plans for San Miguel, Santa Cruz, Santa Rosa, and Anacapa Islands recognize that pinnipeds are very sensitive to human disturbance and, thus, no onshore cleanup should be attempted near haulout or rookery areas (Clean Seas, Inc., no date). A site protection and cleanup plan is not yet available for Santa Barbara Island.

In addition to providing additional time for at-sea containment of spilled oil, NOAA's prohibition on oil and gas operations on future leases in the sanctuary will decrease the risk that spilled oil or other discharges will reach nearshore waters and affect haulout grounds, breeding areas, and foraging areas in toxic quantities. The increased distance from shore provides a greater period of time for natural forces to weather, mix, or re-direct the spilled oil.

In summary, the additional time/space margin provided by the 6-nmi (11.1km) sanctuary boundary is, thus, an important element for protecting the area's resources from potential oil spill impacts.

In order to ensure at least a partial immediate response to an oil spill, NOAA's proposed oil spill equipment regulation requires possible oil and gas development on existing leases within the 6-nmi (11.1km) boundary to meet not only the existing requirements imposed by BLM, USGS, EPA, and others (see Section F.1.b), but also provide onsite oil spill cleanup equipment to assist in preventing damage to nearshore resources. Although OCS Order #7 requires that minimum containment equipment at each drilling location must include a boom, skimming apparatus, and chemical dispersants (U. S. Bureau of Land Management, 1979), this requirement may be inadequate particularly for sites near the Channel Islands. For instance, the California Coastal Commission, in its review of Exxon's Plan of Exploration on blocks 222, 223, 230, 231, 232, and 238 (see Figures F-7 and F-8) for consistency with the California Coastal Plan, has required: (1) 1500 feet (460m) of open ocean spill containment boom; (2) an oil skimming device capable of open ocean use; (3) fifteen (15) bales of oil absorbent material; and (4) a boat capable of deploying the oil spill boom

at the site at all times (California Coastal Commission, 1979).

The Coastal Commission believes that effective onsite spill containment equipment is essential due to the rather long response time (approximately three hours or more) for Clean Sea, Inc. (the responsible oil spill cooperative) to get heavy cleanup equipment to this portion (relatively close to the mainland) of the Santa Barbara Channel (California Coastal Commission, 1979). Chevron (1978), in its environmental report for a proposed exploratory well on lease block 215 in the Santa Barbara Channel, cites the Clean Seas, Inc. general manager's estimate that his firm's equipment can reach the block within seven hours. As Figures F-7 and F-8 illustrate, Block 215 is approximately 8 nmi (14.8km) from Anacapa Island (Chevron, 1978); response time to spills closer to the islands and, therefore further from the mainland, are very likely to be greater.

To protect the waters of the sanctuary from the effects of an oil spill, NOAA will require the equipment required by the California Coastal Commission for the exploration of tracts 222, 223, 230, 231, 232, and 238 (see above) as the minimum onsite oil spill containment equipment for drilling within the sanctuary. Additional equipment requirements set by the California Coastal Commission under the Federal consistency provision of the Coastal Zone Management Act will also apply under NOAA's certification of existing permits (see F.2.c.).

--Acoustic and Visual Disturbance

Oil and gas platforms, rigs, and activities produce both a visual intrusion on the scenic qualities of the islands' seascape and disturbances due to construction activities and the sound and movement of boats and helicopters (U. S. Bureau of Land Management, 1979).

The continuous noise and human activity associated with oil and gas development in nearshore waters and the need for a steady stream of crew and supply boats produce visual impacts and noise which may disturb seabirds and marine mammals, particularly during sensitive nesting, pupping, and migration seasons. If these disturbances occur very close to shore, stampeding by pinnipeds or sudden flight by nesting birds can occur (U. S. Bureau of Land Management, 1979). During critical breeding periods such reactions could result in increased mortality rates in young seabirds and marine mammals (U. S. Bureau of Land Management, 1979).

Oil and gas development may have both negative and positive impacts on the area's recreational values. Negative impacts include: increased congestion; the visual effects of platforms, tankers, and other activities on the open sea; degradation of water quality; and the risk of oil spills. Positive benefits could include the potential aid to navigation provided by development structures and communication assistance for lost or distressed boaters. It is also possible that sportfishing may increase around offshore platforms due to the attraction their artificial reef habitat provides sportfish species (U. S. Bureau of Land Management, 1979).

NOAA's prohibition of future leasing within the 6-nmi (11.1km) sanctuary boundary would lessen the noise and human activity in nearshore waters and also decrease the need for additional supply boats to enter nearshore waters or incidently approach resting or nesting marine mammals or seabirds. NOAA's requirement is in line with the findings in the 1975 Final Environmental Impact Statement (FEIS) on Lease Sale 35 (U. S. Bureau of Land Management, 1975) which considered drilling activity and platform construction one of the greatest dangers to the pinnipeds and seabirds:

"activities associated with platform installation, exploratory drilling and production operations off San Miguel and Santa Barbara Islands could cause significant reductions in seabird populations and the potential elimination of sea lions, fur seals, and harbor seals from their principal breeding area in Southern California" (U. S. Bureau of Land Management, 1975).

In addition, the prohibition of oil and gas activities on future leases within 6 nmi (11.1km) will reduce the potentially adverse aesthetic impact of oil and gas platforms, rigs, pipeline construction, and other activities on the Channel Island National Monument, the other islands, and boats in the area. It also serves to preserve the wilderness character of the island waters from industrial oil and gas development. While the significance of such values as undisturbed views and wilderness is difficult to quantify in monetary terms, their protection is, nonetheless, important, particularly in proximity to heavily populated urban areas such as those in southern California.

--Discharges

A wide variety of pollutant discharges are associated with OCS oil and gas development: drill cuttings and muds; sewage and trash; formation waters; and air pollutants (e.g., petroleum aerosols and engine exhausts).

Drilling effluent discharges include drill cuttings (pulverized rock fragments and chips removed during core drilling) and drill muds (complex chemical mixtures that cool and lubricate the drill bit, transport cuttings upward, equalize hydrostatic pressures, and minimize corrosion of the drill pipe and casing)(U. S. Bureau of Land Management, 1979).

The literature on toxic effects of drilling discharges indicates that, while certain toxic effects must be considered potentially significant, most of the chemical constituents of drilling muds are relatively unreactive in a biologic sense and disperse to background concentrations within a few thousand feet of the drilling site (see, for instance, ECOMAR, 1978), particularly in areas with strong currents such as the waters around the islands.

At present, the data do not warrant further control of normal OCS discharges, such as formation waters and drill cuttings and muds, within the proposed sanctuary beyond the regulations of the Department of the Interior, the Coast Guard, and EPA. If evidence of the need for more stringent controls is found after monitoring and studying operations in the sanctuary, NOAA will take steps to implement further controls.

Air pollutant discharges typically disperse rapidly into the atmosphere or ocean waters and thus pose relatively minor threats to sanctuary resources. A major effect, however, would be on the area's aesthetic qualities and to adjacent regions (e.g., coastal California). In addition, the Channel Islands National Monument (composed of Santa Barbara and Anacapa Islands) has been proposed as a Class I area under the Clean Air Act. Oil and gas development in the vicinity of these islands would greatly enhance the probability that the Class I standards (if the Monument is so designated) would be violated (U. S. Bureau of Land Management, 1979).

--State oil and gas sanctuaries

Finally, of particular importance to the State of California, the prohibition of future leasing with 6 nmi (11.1km) will also help to insure that the State Oil and Gas Sanctuaries can continue to provide protection to nearshore marine resources. If oil and gas development is allowed adjacent to the Oil and Gas Sanctuaries, it is possible that California would have to hold a drainage sale within State waters to avoid losing State reserves.

-- Socioeconomic Impacts of the Proposed Regulation

The economic impact of this prohibition in large part depends on two factors: the estimated selling price of the tracts and the amount of economically recoverable hydrocarbons which would be foregone under the proposed regulations.

Amount of Oil and Gas Reserves Affected

Reliable data on the hydrocarbon reserves within the sanctuary are not available. Approximately half of the proposed sanctuary has never been considered for leasing and NOAA has no resource estimates in these areas. In the remaining half, there are 43 unleased tracts, twenty-four of which were originally considered for Lease Sale #48 and then withdrawn (Leases in the other 19 tracts have expired due to insufficient attempts at development - possibly indicating low resource potential). The U. S. Geological Survey's most recent resource estimate specifically for those 24 tracts was 5.7 million barrels of oil and 8.9 billion cubic feet of gas. This represents approximately 0.8 percent of the oil and 1 percent of the gas reserves estimated for all the tracts considered for Lease Sale 48 in the Final Environmental Impact Statement, or less than 1 day's supply of oil and gas for the United States (average daily consumption in the U. S. is about 19 million barrels of oil and 53 billion cubic feet of gas). Since the publication of the Final Environmental Impact Statement, USGS reduced its resource estimates for the Sale 48 area by about 84 percent (see Table E-14). There is no data available to estimate the precise effect of this revision on the estimates for the 24 tracts around the Islands deleted from the Sale.

The extent to which any resources, whatever their potential, will be foregone as a result of the proposed prohibition is questionable. At least some of the available reserves could be recovered by slant drilling from outside the sanctuary despite any prohibition. Eleven of the forty-three currently leased tracts fall only partially within the proposed sanctuary. Furthermore, in many areas where recovery will be unfeasible under the prohi-

bition, it would be blocked by other agencies. The Department of the Interior has already withdrawn 24 tracts and the number of tracts it would actually offer for lease cannot be predicted. The State of California prohibits oil and gas development within its waters around 4 of the 5 islands in the proposed sanctuary.

Since there is a limited amount of capital available for the development of OCS oil and gas reserves, the prohibition on exploration and exploitation activities on new leases in the sanctuary will have the effect of redirecting rather than stopping investment in oil and gas operations in the southern California OCS in the near future. Thus this proposed prohibition is unlikely to affect the amount invested in offshore hydrocarbon production. Judging by the area leased in OCS Sale 35 and 48 and by the area receiving two or more positive nominations for leasing in the call for nominations for Lease Sale 48, and assuming that there will be about two lease sales every five years, there will be opportunity for exploration over the next 25 years in the Southern California Bight without the excluded sanctuary tracts. However, although positive nominations provide some indication of industry interest, they are not fully accurate indicators of resource potential. In addition, the above estimate of available tracts for investment does not take into account the possibility that patterns of investment could shift toward or away from the southern California OCS.

It is important to note that the proposed prohibition on hydrocarbon activities on new leases in the sanctuary does not necessarily mean that affected reserves will be permanently unavailable. These reserves will be preserved for future use, when technology may improve or the need for resources may increase. In fact, various groups, including Get Oil Out (1978) and the Scenic

Shoreline Preservation Conference, Inc. (1979), have proposed that the Channel become a hydrocarbon reserve so that resources can be saved for specific uses (such as petrochemicals) for which suitable substitutes are not yet available. Should petroleum technology improve so that the risk of injury to sanctuary resources would be sufficiently reduced, sanctuary regulations could be changed to allow development subject to appropriate controls. However, a decision to reevaluate the prohibition on petroleum activities would be based on a requirement to permit only those activities consistent with the fundamental purposes of the sanctuary, particularly living marine resource protection.

Effect of Federal Income from OCS Leasing

The proposed prohibition could reduce U. S. income from offshore leasing. It is unlikely that the industry will bid on affected tracts located completely within the sanctuary if those tracts are offered in future lease sales. Tracts located partially within the sanctuary would also be less attractive to industry given a prohibition on drilling in the sanctuary and would draw lower bids or none. This change in bidding could represent a reduction of revenue to the U. S. Treasury if these leases might otherwise have been sold. The total amount of lost revenues cannot be estimated at this time. The prices of leases are based on data much of which is proprietary. Furthermore, the future prices of leases in the Channel will depend heavily on the results of exploratory activity from Sale 48. Prices for tracts leased in earlier sales do not follow any clear geographic pattern. The Department of the Interior estimated the social value of the 24 tracts deleted from Sale 48 to be \$1 million* (U. S. Department of the Interior, 1979c). The social value is the savings gained by producing oil

* This estimate is based on the reduced USGS resource estimates.

domestically rather than importing it. The Federal government obtains most of these savings through leases, royalties, and taxes.

Effect on Industry

Under this proposed prohibition the petroleum industry would forego the profits it could otherwise realize from the development of the affected tracts. Companies that have leased tracts in the area include Texaco, Chevron, Exxon, Mobil, Continental, Union, Phillips, and Champlin oil companies. However, as discussed above, in the short term, this prohibition will impose only minor losses, if any, on the industry, because operators can channel their capital for exploration and development to other areas of the Southern California Bight. If resources in the sanctuary were substantially higher than in other portions of the Bight, industry would forego a higher profit margin. However, the data available from USGS indicate that the resource potential in the excluded tracts is relatively low.

Finally, development on tracts and portions of tracts within 6 nmi of the Islands which are already leased would have to meet the proposed provision requiring 1500 ft of open ocean spill containment boom, 15 bales of oil sorbent material, an oil skimming device for open ocean use, and a boat capable of deploying the boom on location. Since these requirements exceed those imposed by USGS operating order #7, they would impose some additional costs on the industry. However, since it is likely that in many cases the California Coastal Commission would also require identical onsite spill containment equipment, NOAA's minimum may not impose any additional cost.

Sectors Affected

The primary sectors affected are the Federal and State of California governments because of the loss of possible revenues from lease sales. However, the State of California already has an oil and gas sanctuary surrounding 4 out of 5 of the islands in the proposed sanctuary. The oil industry would forego the profits it might otherwise realize from the sale of the oil under the affected tracts. However, as discussed above, in the short run, the regulations would redirect rather than curtail oil and gas investment activities. The oil industry might also have slightly greater costs to meet the oil spill contingency requirements. Offshore drilling and service industries may also be indirectly affected in the long run. The tourism and recreation industry in the Santa Barbara and Ventura area may benefit from the restriction on petroleum development around the Islands, but these benefits cannot be estimated. Sport and commercial fishing may also gain from this regulation, although, again, the possible economic gains cannot be projected precisely.

2. Discharge of polluting substances

No person shall deposit or discharge any materials or substances of any kind except:

- (A) indigenous fish or parts and chumming materials;
- (B) effluents from marine sanitation devices;
- (C) nonpolluted cooling waters from ocean vessels;
- (D) effluents incidental to those hydrocarbon exploration and exploitation activities with an NPDES permit.

The proposed regulation prohibiting discharging and littering within the sanctuary complements the existing regulatory system and would enhance the area's overall recreational and aesthetic appeal. At present, specific discharges such as oil are regulated in order to protect the marine environment. In particularly sensitive offshore zones, such as those designated by the State of California as areas of special biological significance (ASBSs), harmful discharges are prohibited (This prohibition does not apply to vessels, (see Section F.1.6)).

This regulation would ensure that solid wastes will not degrade wildlife rookeries or otherwise alter the area's aesthetic appeal. It would prevent floating or submerged waste debris (e.g., non-biodegradable plastic or metal objects) from entering foraging areas, where they could be ingested, possibly leading to unhealthy conditions or death. Under current human activity levels casual littering, most notably by recreational boaters, is not widespread and observed adverse impacts upon resources have so far been minimal (Johnson, 1979, personal communication). NOAA's regulation would ensure that future activity level increases do not lead to substantial degradation. In addition, this regulation prevents the discharge of hazardous substances which are not yet regulated. The prohibition will also prevent the possibility of dredge disposal or ocean dumping in the area in the future.

The impacts of this regulation on sanctuary users is expected to be minor; trash will have to be kept on boats and disposed of at proper facilities, most likely on the mainland.

3. Alteration of or Construction on the Seabed

Within 2 nmi (3.7km) of any island, no person shall dredge, drill, or otherwise alter the seabed in any way, nor construct any structure, except for a navigation aid or except in connection with any hydrocarbon exploration or exploitation activity otherwise allowed by sanctuary regulation.

Dredging and dredge disposal activities, while not ongoing within the proposed sanctuary area, represent a potential threat to particularly sensitive marine resources. Foremost among these potentially adverse impacts would be increased turbidity levels, disruption/displacement of benthic communities, and human intrusions near seabird and marine mammal concentrations. A 2-nmi (3.7km) offshore buffer area will help ensure that these impacts do not affect breeding grounds, haulout areas, and adjacent foraging areas.

Dredging for pipeline construction (i.e., for oil, water, and gas) is allowed subject to authorization by the California Coastal Commission and all other regulating agencies.

This regulation will enhance resource protection by prohibiting the presence of large, and often noisy, dredging machinery within 2 nmi (3.7km) of the shore. Thus, both over the short and long-term, human intrusion upon marine wildlife along with potentially adverse impacts on their food supplies (e.g., benthic and pelagic fish resources) will be minimized. By prohibiting dredge disposal in the immediate vicinity of marine bird and mammal breeding grounds and haulout areas, risks from the distribution of contaminant materials (e.g., toxic substances, heavy metals) are

reduced. However, there has been no evidence of contamination to date within the study area.

No economic impacts upon commercial firms are expected because current dredging operations are located outside of the sanctuary's boundaries and no zone within the 6 nmi (11.1km) boundary is used for dredge spoil disposal. Dredging restrictions may limit the harbor facilities of the Channel Islands if expansions are proposed in the future. This may affect visitor access to the Channel Island National Monument islands of Anacapa and Santa Barbara, but the precise extent of impact is presently unknown.

4. Operations of Vessels and Aircraft

Except to transport persons or supplies to or from an island, or for enforcement purposes, no person shall, within 1 nautical mile of any island:

- (A) fly any aircraft at less than 1000 feet; or
- (B) operate any vessel unless engaging in activities directly associated with the resources of the area including but not limited to commercial or recreational fishing (in accordance with Article 5, section 1 of the Designation), research, sightseeing, and diving or other recreational activities, and the primary purpose of such vessel is to engage in such activities.

To the extent consistent with international law, within 1 nmi (1.8km), NOAA would allow vessel traffic by commercial fishing and kelp harvesting, research, enforcement, and recreational vessels, but prohibit all other vessel operations, except those necessary for access to the islands.

This regulation will reduce certain environmental impacts within 1 nmi (1.8km) from large commercial vessels including: (1) visual and acoustic disruption of hauled out seals and sea lions, nesting seabirds, and whales; (2) possible accidents involving groundings or collisions with nearshore vessels; (3) routine or accidental discharge of pollutants (from ballast discharge, tank washing, and bilge bunkering) directly into important nearshore habitats; and (4) aesthetic intrusion on the view from the islands.

It is difficult to predict what level of human intrusion will disturb marine mammals and birds. Frequently, birds will act as sentinels; warning signals by birds will cause hauled out pinnipeds to flee. Shyness varies according to species, time of year, location of the animals, and nature of the disturbance, among other factors (Beach, 1979, personal communication).

DeLong (1975) reported that the mere sight of a passing vessel off crowded pinniped haulout areas has been sufficient to cause a stampede into the ocean. If pups are in the hauled out herd, larger seals or sea lions may trample, kill, or injure smaller animals in their rush to the sea. Stampedes may also cause permanent separation of pups from their parents as a result of the confusion. Similarly, a ship passing near the shore may frighten nesting birds and leave chicks and eggs unprotected. However, other reports indicate that on occasion pinnipeds may show relative indifference to small vessels as long as they do not land or make noise.

As noted in section E.3.d., a significant amount of vessel traffic currently uses the Santa Barbara Channel. A U.S. Coast Guard survey reported a daily average load of nine large vessels (300 feet or 90m, or even longer) and seven medium (100-299 feet or 30-90m long), small (less than 100 feet or 30m) or tug-in-tow vessels en route along the Traffic Separation Scheme (TSS) in a northerly direction (Cherney, et. al., 1978). In addition, current traffic levels are likely to increase as a result of new southern California offshore oil production and a number of other maritime projects now being planned. If vessels remain in the TSS, they will not infringe on the 1 nmi (1.8km) buffer (Figure F-14). While compliance with the TSS has been good (Adie, 1979, personal communication), it is not mandatory; vessels can and occasionally do enter nearshore waters.

In addition to disturbing marine mammal and seabird rookeries, nearshore vessel traffic would create an aesthetic impact out of character with the present wilderness and recreational features of the islands and surrounding waters. Tankers and freighters transitting the Channel are substantially larger than other craft in the area, ranging in length from slightly less than 100 feet (30m) to more than 300 feet (90m). On the other hand, commercial fishing boats range in size from about 35 feet (10m) to 85 feet (26m) and most recreational vessels average approximately 35 feet (10m) (Johnson, 1979, personal communication; Larson, 1979, personal communication). The DFG presently protects particularly sensitive areas from small boat intrusion through its Ecological Reserve Program (see Section F.1.b). OCS supply and crew boats, although they do not generally exceed 65 feet (20m) (Cassel, 1979, personal communication), have no need to enter nearshore waters and are therefore subject to the regulatory prohibition.

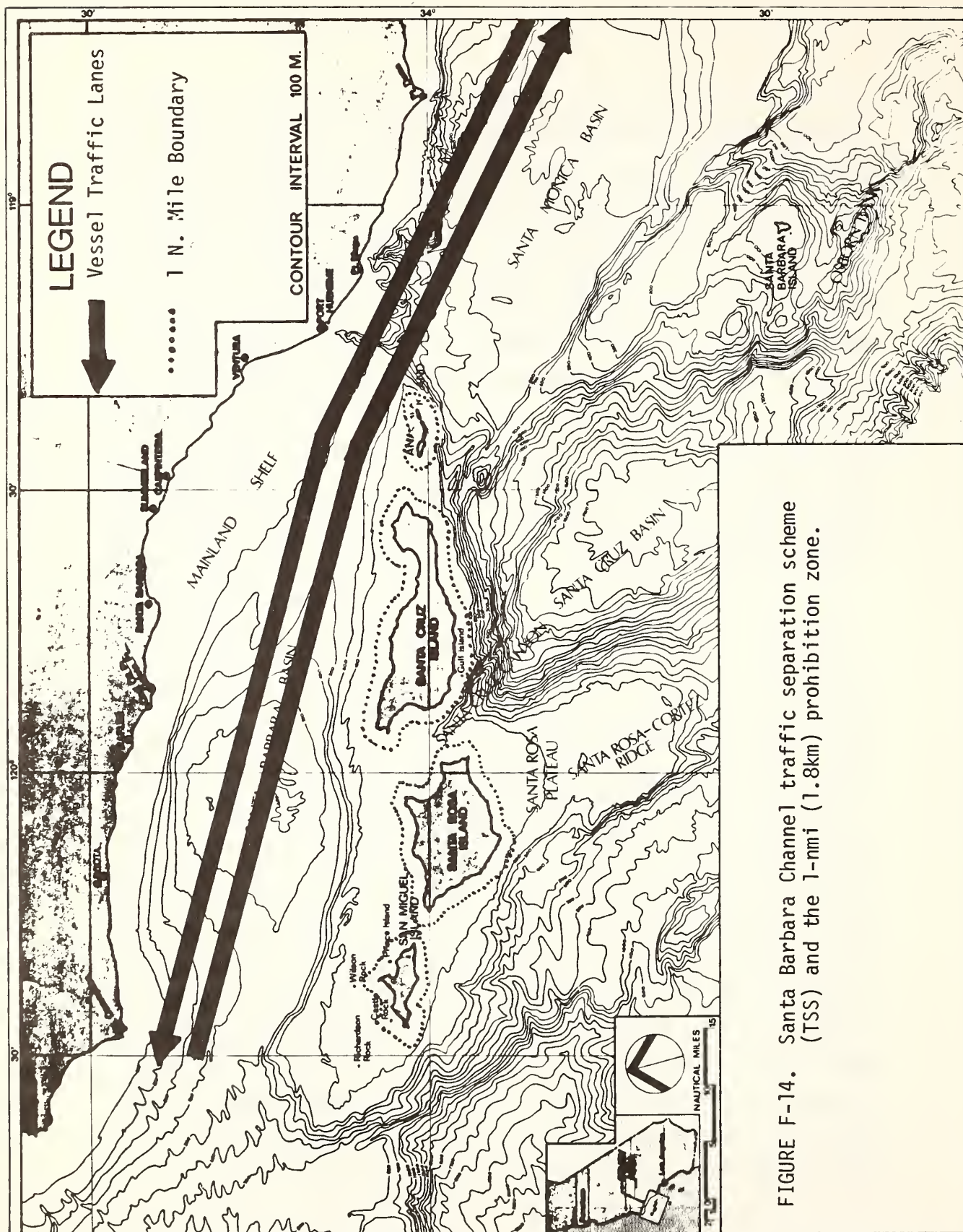


FIGURE F-14. Santa Barbara Channel traffic separation scheme (TSS) and the 1-nmi (1.8km) prohibition zone.

Finally, the restriction on some commercial traffic within 1 nmi (1.8km) reduces the risk that vessels will collide with the smaller recreational, fishing, or other boats. The nearshore area is more treacherous to navigate due to shallow rocky areas. Prohibiting nearshore navigation by larger vessels would thus reduce both near-island spills and pollution resulting either from collisions or from accidental groundings.

Exclusion of certain vessels from a 1 nmi (1.8km) band around the islands will not result in extended travel times to port or other major impacts on commercial shipping because vessels generally adhere to the TSS. In fact, it is the most direct route for transitting the region. Those vessels which have any need to be present in this particular nearshore zone are exempted from the regulation.

As noted for vessels, the prohibition on overflights below 1000 feet (305m) is designed to limit potential noise impacts--particularly those that might startle seals and sea lions hauled out or birds nesting along the shoreline margins of the sanctuary. It would complement the existing California Fish and Game regulation (which prohibits overflights below 1000 feet (305m) over San Miguel, Anacapa, and Santa Barbara Islands) by extending prohibitions out over adjacent water areas where these animals forage. It would also parallel the National Marine Fisheries Service's selective prohibition of overflights under 1000 feet in areas where marine wildlife harassment is likely. This regulation would affect recreational aircraft and some charter airline groups which fly passengers over the islands to enjoy the scenery or observe whales. As noted in section E.3.g., two companies presently charter planes for nature observation. In addition, a number of

private planes in the area may, on occasion, fly over migrating gray whales around the islands.

This regulation will contribute to the protection of natural, undisturbed behavior patterns of marine mammals and seabirds concentrating and breeding along island shorelines. Necessary and reasonable uses of the area's air space, such as Coast Guard surveillance, kelp bed surveys, landing at island airstrips, and military operations, would be exempted. Since no commercial airlines (other than the above mentioned charters) fly regular routes over the islands at these low altitudes, this regulation should pose no burden on other commercial airline carriers.

Although the charter planes often fly as low as 75-100 feet (23-30m) and private planes on occasion as low as 50 feet (15m) (Glendinning, 1979, personal communication), marine mammals can still be seen from altitudes of 1000 ft. (305m) or above.

5. Removing or Damaging Historical or Cultural Resources

No person shall remove or damage any historical or cultural resource.

This regulation is aimed at protecting archaeological or paleontological resources from damage and/or removal. Additionally, NOAA will seek listing of identified resources on the National Register of the National Historic Preservation Act. Listing in the National Register would make possible grant and survey funds from the Secretary of the Department of the Interior (DOI) (Heritage Conservation and Recreation Service) to study the

artifacts and identify their distribution. Listing on the National Register also insures that proposed activities which could affect the resource are carefully reviewed. This regulation should not significantly affect activities within the sanctuary.

c. Other Activities

--Permits for certain research activities

Permits to conduct specific research activities which are otherwise prohibited by sanctuary regulations may be issued by the Assistant Administrator of the Office of Coastal Zone Management if such research is: (1) directly related to the resources of the sanctuary or (2) to further the sanctuary's education value, or (3) for salvage or recovery operations.

A permit system would allow research activities which would otherwise be prohibited by sanctuary regulations. For instance a study of the effects of introducing pollutants could be permitted if it would contribute toward increased understanding of the sanctuary area and its resources and not cause substantial harm. The primary advantages of the permits would be to allow research projects which could not be allowed on an uncontrolled basis and to enable more effective management of the resources. OCZM would seek to coordinate its permit process with that for the Marine Mammal Protection Act and the Endangered Species Acts.

--Defense Activities

The regulations shall not prohibit any activity conducted by the Department of Defense that is essential for national defense or because of emergency. Such activities shall be conducted consistently with the sanctuary regulations to the maximum extent

practicable. All other activities of the Department of Defense are subject to regulation.

NOAA has no information to indicate that military operations as currently conducted in sanctuary waters harm the sanctuary's marine mammal, seabird, fish, or intertidal marine life. Indeed, the Navy has ongoing efforts to protect the natural marine resources of San Miguel Island. These include turning management authority for San Miguel Island over to the National Park Service and conducting its activities in areas as far away as practicable from key marine mammal and seabird concentration points such as Point Bennett on San Miguel Island.

NOAA/Navy consultation efforts might enhance protection of marine life in the area. Increased protection might be realized through monitoring and studies which would coordinate military operations and provide guidance to assure minimum interference with critical life stage periods and habitat areas for significant marine life. Since military operations necessary for national defense or emergency will not be prohibited, the sanctuary will not significantly inhibit military activities.

A potential threat to marine birds and mammals is the United States Air Force's Space Shuttle Vehicle System (SSVS). This project is expected to create overpressures resembling jet aircraft sonic booms in and around the northern Channel Islands during both takeoff and reentry (see Section E.3.e). The Air Force is now conducting a special noise impact study to evaluate the intrusive effect which these intermittent flights could have upon island fauna, including seabird and marine mammal populations, particularly on San Miguel Island (Wooten, 1979, personal communication).

In the proposed sanctuary, NOAA and the Air Force would consult both during this impact assessment period and throughout the life of the SSVS. The effects upon marine birds and mammals could be closely monitored and, wherever possible, joint steps could be taken to minimize environmental harm without hindering the program's effectiveness.

--Fishing and Plant Harvesting

Fishing and plant harvesting are not subject to sanctuary regulation (except with respect to discharges.)

In its decision advising NOAA to proceed with the preparation of a Draft Environmental Impact Statement for the proposed marine sanctuary, the California Coastal Commission (CCC) also recommended that the management of living marine resources remain under the jurisdiction of the California Department of Fish and Game (DFG) and the Pacific Fisheries Management Council (PFMC).

NOAA's analysis of living marine resources in section E and the existing State and Federal management system (i.e., California DFG and the PFMC) has shown that these authorities can adequately protect acknowledged resources. By relying on the existing arrangements, NOAA will avoid unnecessary duplication of regulations and programs.

NOAA will consider the possibility of making funds available for technical assistance for studying the area's marine finfish, shellfish, and plant resources and for strengthening the present enforcement capabilities of the DFG and other enforcement entities including the National Park Service and the Coast Guard (see Management, below).

d. Management

While the preceding regulations provide the most direct form of protection for the resources of the proposed marine sanctuary, an equally important and beneficial element of marine sanctuary designation will be onsite management. The sanctuary manager will have two types of responsibility: (1) the enforcement of the regulations, and (2) the administration of policies and programs to maximize the area's beneficial use in a nonregulatory manner.

Under the proposed action the sanctuary manager will:

- Enforce the regulations, in cooperation with the U. S. Coast Guard,
- Establish a Sanctuary Information Center,
- Promote awareness of sanctuary resources,
- Maintain a register of research projects with the Sanctuary Information Center,
- Monitor the resources and the effects of human activities in the sanctuary,
- Encourage research and evaluate permit requests for research and educational activities otherwise in violation of sanctuary regulations,
- Compile an inventory and map of historical resources, and

- Consult with other authorities in the sanctuary to exchange information and coordinate activities and policies.

NOAA plans to delegate onsite management to an existing authority in order to benefit from the expertise of agencies familiar with the area. For example, NOAA is now involved in discussions with the California Department of Fish and Game and the National Park Service on the possibility of coordinating management with those agencies. Both entities have had considerable experience managing the resources, activities, and problems occurring in and around the proposed marine sanctuary area.

--Enforcement

Although a detailed management plan for the sanctuary will not be prepared until after the sanctuary is officially designated, NOAA presently envisions a State-Federal cooperative enforcement system involving the California Department of Fish and Game (DFG), the U.S. Coast Guard, the National Marine Fisheries Service (NMFS), and the National Park Service (NPS). Since the proposed sanctuary would include both State and Federal waters, close coordination between State and Federal authorities would be required.

As noted in section F.1.b., the DFG and the NMFS have a cooperative agreement to enforce the Fishery Conservation and Management Act; the DFG and the NPS have a cooperative agreement concerning NPS enforcement of California Fish and Game regulations within 1 nmi (1.8km) of San Miguel, Santa Barbara, and Anacapa Islands. A new cooperative agreement, modeled after the existing ones, could be adopted within the sanctuary which would allow the DFG, NMFS, and NPS within 1 nmi (1.8km) of San Miguel, Santa

Barbara, and Anacapa Islands to jointly enforce existing State and Federal regulations as well as sanctuary regulations. As noted under the discussion of living marine resources in Section E.2 above, it is also possible that NOAA could provide funds to strengthen the present management and enforcement capabilities of the DFG, NMFS, and NPS.

Congress is currently considering proposals to create a Channel Island National Park. The House has passed H. R. 3757 (U. S. House of Representatives, 1979) and the Senate is considering S1104 (U. S. Senate, 1979). Both bills would encompass all the islands embraced by the proposed sanctuary, including the submerged lands and waters 1 nmi (1.8km) offshore of each island.

If the park is designated, particularly with a 1 nmi (1.8km) seaward boundary, it is likely that the staff and facilities of the present NPS staff for the Channel Islands National Monument will increase from 7 rangers to approximately 14 or more (Johnson, 1979, personal communication). This increase would allow the NPS to provide additional assistance in enforcing California Fish and Game regulations and, if designated, sanctuary regulations.

Since the proposed marine sanctuary relies heavily on existing regulations for the protection of the area's resources, its enforcement agents would also enforce regulations imposed by other authorities. Thus, the marine sanctuary would provide protection for the area not only by imposing new regulations, but also by enhancing the effectiveness of existing regulations by providing funds for additional enforcement.

--Education and Research

A major responsibility of the sanctuary manager is to enhance education and research efforts. An integral component of that effort would be the establishment of the Sanctuary Information Center, which would also serve as administrative headquarters for the sanctuary. The Sanctuary Information Center would be primarily a research and education facility intended to serve as a repository for scientific literature and information on resources and activities in the sanctuary, as well as visitor orientation and education materials such as slides, brochures, and displays. The visitor information would help tourists and recreationists more fully appreciate and enjoy the resources of the sanctuary; at the same time, it would apprise them both of regulations and the need for protecting marine resources.

The general information collection would include both technical and nontechnical reference material for public use in studying sanctuary resources and would collectively provide as complete and detailed a description of sanctuary conditions and use over time as possible. To further this end, the sanctuary managers would ask researchers to notify the Sanctuary Information Center of projects in the sanctuary and to submit reports of their research. This notification process would result in a master listing of research projects conducted from the time of designation. This listing would be continually updated and kept open for public use.

A notification procedure should ensure that research parties are not only familiarized with existing regulatory controls but also that they better understand which resources are particularly susceptible to adverse research-related impacts. In addition, the master listing could: (1) provide a record of scientific investigations which might provide important management information; (2) contribute to efforts to monitor use patterns within the sanctuary; (3) be of assistance in identifying areas of research not receiving adequate attention; and (4) insure that sanctuary managers are aware of relevant area-specific studies and literature. Finally, this notification process could provide both sanctuary managers and researchers with a record of individuals and groups who have firsthand experience with the area's resources. This would provide a valuable tool for coordinating research efforts and encouraging multidisciplinary analyses.

The notification of research projects in the sanctuary and the submission of reports on the research to the Sanctuary Information Center would constitute a slight inconvenience for researchers. However, in turn, researchers could benefit from the resources of the Information Center and, unless the research would require a permit (see above in this section) notification would not impose any delay.

To the extent possible, efforts to develop the Sanctuary Information Center will be coordinated with existing systems, particularly that developed for the Channel Islands National Monument by the National Park Service. The Information Center would be located on the mainland, possibly in the same place as the headquarters of the Channel Islands National Monument in Ventura.

The compilation of technical documents in the Sanctuary Information Center will provide a baseline of site-specific information which would help long-term environmental analysis and encourage further research within sanctuary boundaries.

In addition to providing information and coordination to attract researchers to the proposed marine sanctuary, the sanctuary manager will directly encourage research by sponsoring monitoring programs, providing partial funding for research, and encouraging researchers and funding organizations to conduct or support studies in the sanctuary. The monitoring effort will focus on the overall health of the natural resources of the area as well as the level and effects of human activities occurring nearby. The information gained from such monitoring efforts and other research projects should enable NOAA to manage and regulate the sanctuary more effectively, and to assist other applicable authorities in carrying out their responsibilities.

Another objective of the sanctuary managers would be to map and compile an inventory of historical resources. As part of BLM's baseline study of the Southern California Bight, Science Applications, Inc. (1978) listed the known wrecks around the northern Channel Islands. Although some archaeological research has been conducted on the islands themselves, no research or mapping has been done on the possible historical artifacts in the waters around the islands.

Finally, the sanctuary manager will promote coordination between all the authorities in the sanctuary, and will particularly stress consideration of the special value of the marine sanctuary's living resources in the formulation of policies affecting the area. The greater understanding of sanctuary resources and the effects of human use gained as a result of the research and monitoring described above will enable NOAA to provide valuable assistance to other authorities in the area in deciding upon the best level of protection for the natural resources of the sanctuary.

F.3. ALTERNATIVE 3

Boundaries

The sanctuary consists of those waters off the coast of California adjacent to the northern Channel Islands and Santa Barbara Island, seaward to a distance of 6 nautical miles (11.1km).

The boundary and the proposed regulations for discharges, removing or damaging historic or cultural features, defense activities, and fishing and plant harvesting are the same and have the same environmental consequences as those discussed in the preferred alternative. More stringent regulations for hydrocarbon operations, seabed alterations, operations of vessels and aircraft, and firearms, as well as management provisions are described below, and alternative 3 is compared to the preferred alternative at the end of this section.

Prohibited Activities

Hydrocarbon operations

- (a) Hydrocarbon exploration and exploitation activities are prohibited, except on those leases that predate the sanctuary designation which are located entirely within the sanctuary. Operations on such leases are allowed subject to all prohibitions, restrictions, and conditions imposed by the Department of the Interior, the Coast Guard, the Corps of Engineers, and the Environmental Protection Agency, and all other agencies and subject further to the requirements that certain oil spill contingency equipment (see Section F.2.b.) be available on site for such operations.
- (b) Resources underlying tracts located partially within the

sanctuary may be recovered by directional drilling from platforms outside the sanctuary boundaries.

The environmental consequences of prohibiting operations on future leases within 6 nmi (11.1km) are the same as those of the preferred alternative. Alternative 3 is, however, more stringent because the siting of drilling rigs and platforms within the sanctuary is prohibited, except on tracts 243 and 244 which are located entirely in the proposed sanctuary. Without this exclusion, the lessees of tracts 243 and 244 would be completely prohibited from developing their lease. The prohibition on operations affects these existing tracts: 203, 204, 205, 243, 244, 245, 246, 247, 289, 290, and 291 (see Figures F-12 and F-13). Under this alternative, resources from these tracts may only be recovered by drilling from platforms situated more than 6 nmi (11.1km) from the islands.

This prohibition would extend the level of sensitive resource protection provided by the preferred alternative's prohibition of oil and gas operations on future leases within 6 nmi (11.1km) around the five islands (except for tracts 243 and 244). This action would further lessen the risk of oil spills and routine discharges reaching sensitive nearshore resources in toxic quantities and would increase the response time available for at-sea oil spill containment should a spill occur on an existing lease. Supply boat traffic and other disturbances associated with oil and gas development would also be reduced near the islands.

The economic effects of prohibiting the location of platforms and rigs on existing leases within 6 nmi (11.1km) of the islands are difficult to quantify. Operators can still exploit resources in the sanctuary from platforms located beyond the 6 nmi (11.1km)

boundary, but this siting requirement is likely to increase the cost of reaching these reserves or reduce the total amount of reserves ultimately recoverable from that lease. Although no drilling is currently occurring within 6 nmi (11.1km) of the islands, several adjacent discoveries have been made. For example, tract 202 and the adjacent tract 203, are being developed by Union; a platform--Gina--is to be located on tract 202. Platform Gina will be approximately 9 statute miles (14.4km) from Anacapa Island (Adams, 1979, personal communication). Discoveries have also been made on tracts 204 and 205. Because of the traffic separation scheme (TSS) and policies against siting in it, the exploratory wells to define these reserves were drilled north of the TSS and thus further from the islands. Because the rest of the reserve appears to underlie tracts 208 and 209 (north of the islands -- see Figures F-12 and F-13), the platform will probably be sited north of the northerly TSS lane and thus well beyond the 6-nmi (11.1km) boundary (Adams, 1979, personal communication).

Because tracts 245-247 south of Santa Rosa Island and tracts 289-291 near Santa Barbara Island have had zero and one exploratory well respectively, no reliable estimate of reserve potential, location of reserve, or possible location of a platform can be made (Adams, 1979, personal communication).

The rationale for and effects of NOAA's required additional onsite oil spill contingency equipment are discussed under alternative 2, the preferred alternative.

Alteration of or Construction on the Seabed

Within the sanctuary, no person shall dredge, drill, or otherwise alter the seabed in any way, nor construct any structure, except for navigation aids (or in connection with any hydrocarbon exploration or exploitation activity otherwise allowed by sanctuary regulation).

This regulation differs from that of the preferred alternative by extending the prohibition over the entire sanctuary area rather than only within 2 nmi of the islands. This expanded prohibition offers slightly greater protection from displacement or sediment smothering to the benthic resources of the proposed sanctuary; however, it would provide relatively little additional protection to marine birds and mammals, and shallow subtidal and intertidal organisms.

Operations of Vessels and Aircraft

Within 1 nmi (1.8km) of any island, no person shall operate any vessel nor fly any aircraft at an altitude of less than 1000 feet (305m) except:

- (A) to transport persons or supplies to or from an island; or
- (B) in the case of aircraft or vessels whose primary purpose is commercial or recreational fishing, kelp harvesting or surveying, boating, diving, and other recreational activities, research, law enforcement, and sea and air rescue.

Within the remaining portions of the sanctuary,

- (A) U.S. flag and, to the extent consistent with international law, foreign flag vessels (except for fishing, military, kelp harvesting, enforcement, research, and recreation vessels) traveling parallel to established shipping lanes shall remain in those lanes, and
- (B) no person shall fly any aircraft at an altitude of less than 500 feet (152.1m).

Alternative 3 incorporates from alternative 2, the prohibition on most commercial vessel traffic within 1 nmi (1.8km) of the islands. In addition, alternative 3 requires that all commercial traffic -- U.S. flag and, to the extent consistent with international law, foreign flag vessels -- traveling parallel to established shipping lanes must remain in shipping lanes while transiting sanctuary waters.

As discussed under the preferred alternative, most commercial traffic already follows the traffic separation scheme. This regulation would preclude trip shortcutting, either through island passages or close to their shores. However, since few large commercial vessels have used such shortcuts, little inconvenience to commercial shipping traffic due to this restriction is envisioned. This regulation would remove certain collision, intrusion, and pollution risks from the islands; nearshore zones which contain some of the region's more sensitive resources, as discussed in the preferred alternative and in section E.

NOAA's regulation of overflights under alternative 3 would include and expand upon regulations described under the preferred alternative. In addition to prohibiting overflights below 1000 feet (305m) within 1 nmi (1.8km) seaward of the mean high tide line of the islands and exposed rock, NOAA would prohibit aircraft flights below 500 feet (152m) over all other areas of the sanctuary.

This regulation would extend protection from low flight engine noise to offshore areas of a 6-nmi (11.1km) sanctuary, as well as onshore and nearshore marine mammals and seabirds. The purpose of this added regulation is to protect swimming marine mammals from harassment by aircraft engaged in whale watching or other activity. As described under the preferred alternative, this regulation would affect only some charter planes and recreational flyers; commercial carriers do not fly at such low altitudes and military planes and kelp survey flights are exempt. This regulation would not supercede more stringent regulations prepared pursuant to the Marine Mammal Protection Act.

Firearms

No person shall use firearms, except as necessary for military operations and enforcement.

This regulation is designed to protect the area's resources from direct harm and indirect disturbance, as well as to protect the safety of sanctuary users. Because State and Federal regulations (see section F.1.b.) prohibit the use of firearms in many situations, the impacts of this prohibition on sanctuary users are expected to be minimal.

Other Activities

Fishing and Plant Harvesting

Fishing and plant harvesting are not subject to sanctuary regulations, except in specified research zones (see Management, below).

The implications of restricting the harvesting of living marine resources in specified research zones are discussed in the Management section. Otherwise, the environmental consequences of this regulation are the same as those discussed in the preferred alternative.

Management

The management system applied under this alternative would be the same as that described under the preferred alternative, except that this alternative would establish specific research zones in the sanctuary. Because of similarities between alternative 3 and the preferred alternative, the discussion focuses on establishing additional research areas.

The purpose of establishing research zones would be to dedicate areas within the sanctuary to research. One of the primary purposes of these sites is to gather baseline information on sanctuary conditions which reflect as closely as possible the natural undisturbed state of ecosystem processes, biotic diversity, abundances, and general environmental conditions. Neither the exact location, number, or size of these areas has been

selected; such specifics would be developed after a more thorough consultation with area researchers, area user groups, and applicable authorities, such as the California DFG. In general, the system of sanctuary research areas envisioned might include perhaps three to five sites of variable sizes dispersed throughout the sanctuary (e.g., one or two off San Miguel, one off Anacapa Island, and one off Santa Barbara Island).

Within these research zones, only selective scientific studies such as taking water samples or limited numbers of marine organisms for laboratory analysis would be allowed. Other uses within reserves zones would be limited to those with negligible impacts. Boat access would be allowed on a case-by-case basis but all consumptive or potentially polluting/disturbing uses would be prohibited. Commercial and recreational fishing would be limited to areas outside research zone boundaries. Discharges, transit by large vessels, pipelines, and other potentially disruptive uses would similarly be excluded. Research would be allowed in these zones under permit from sanctuary managers and would be controlled to prevent significant impact to natural resources. NOAA would seek inclusion of these marine research zones in existing systems which identify and/or set aside areas solely for research purposes. Examples include the National Science Foundation's system of Experimental Ecological Reserves and the Federal Committee on Ecological Reserves' system of Research Natural Areas.

This management measure would result in an improvement in natural conditions within established research zones. The extent of improved protection would be proportional to the extent that disruptive activities are excluded. The information developed from studies within these zones will assist sanctuary managers in assessing effects other sanctuary users might have on different

portions of the sanctuary. In this manner, research zones should have a beneficial effect of areas beyond their boundaries through their contribution to improved management capability. The establishment of research zones would thus recognize research interests as representing a valuable ocean use which has a right to the exclusive use of localized ocean areas in much the same manner other areas are set aside for recreation, military activities, or oil and gas development.

The establishment of research zones could limit and perhaps displace several other uses of the area's resources, most notably fishing and plant harvesting and various recreational activities. The extent of these impacts would be proportional to the size of the area and the intensity to which it is currently used.

The displacement of uses, such as recreation, from these research areas may intensify use and impacts in other ocean areas. For example, the prohibition of recreational diving from a previously available area could lead to increased diving pressure in another area. NOAA would try to minimize such potential impacts and concerns by working closely with both area users and research interests on the selection of areas. Areas with high research value and minimal use by ~~fishing and plant harvesting~~ and recreational users would be sought.

Comparison with the Preferred Alternative

Although Alternative 3 is more environmentally protective than the preferred alternative, it has been rejected for several reasons.

Because there are no oil and gas activities occurring within the proposed sanctuary, and only 11 potentially developable tracts, further restrictions on oil and gas development activities on existing leases is not deemed necessary at this time. Furthermore, this prohibition could make certain reserves on leased tracts inaccessible and thus constitute a taking of the lease. Development on future leases is banned by the preferred alternative.

The regulation prohibiting seabed alteration and construction throughout the sanctuary would provide little protection beyond the preferred alternative to marine birds and mammals and intertidal and nearshore subtidal organisms. These resources are most vulnerable in the nearshore areas.

The regulation prohibiting most commercial vessels from the waters within 1 nautical mile of the islands is identical to the regulation in the preferred alternative. Since minor disturbances beyond 1 nautical mile from the islands are less likely to disrupt critical bird and mammal behavior, and since most vessels observe the TSS anyway, the regulations requiring vessels to stay within the shipping lanes is not considered necessary. The 500 foot (152m) overflight restriction from 1 nmi (1.8km) to 6 nmi (11.1km) offshore is also not warranted because, as described above in the preferred alternative, the greatest danger from disturbance to marine birds and mammals is at rookeries and resting places. Beyond 1 mile from shore, the harassment provisions of the Marine Mammal Protection Act probably provide adequate protection.

The need to restrict firearms is presently unclear. Federal and State laws regulate the use of firearms and hunting of most species in the area; additional regulation does not appear warranted at this time.

The additional controls imposed upon uses, including fishing and plant harvesting in specified research areas, would provide some protection for the area's resources beyond that afforded by the preferred alternative. At the present time, however, the need for an additional level of protection is unclear. Although the establishment of research zones could have substantial benefits for research, NOAA prefers to work with the California DFG through the State's ecological reserve program to accomplish this. The other aspects of sanctuary management are the same as those in the preferred alternative.

ALTERNATIVE 4

Boundaries

The sanctuary consists of the entire Santa Barbara Channel from Point Arguello to Point Mugu and 12 nautical miles around the northern Channel Islands and Santa Barbara Island.

This sanctuary includes the Santa Barbara Channel from Point Arguello north of Point Conception to Point Mugu east of Anacapa Island and extends 12 nmi (22.2km) seaward from the high water mark around the northern Channel Islands and Santa Barbara Island.

This boundary alternative includes most of the waters and airspace utilized by resident and transient marine mammals, seabirds, and fishes for primary habitat, foraging, or migrations. The area also includes most of the existing and projected offshore petroleum development of the Southern California Bight, as described below. This boundary option includes the same water area proposed in the sanctuary nomination by the County of Santa Barbara (Resources, 1978). In addition, however, it incorporates adjacent State waters not included in that nomination.

In alternative 4, the proposed regulations concerning overflights and alteration of or construction on the seabed are identical to those of the preferred alternative. The regulations concerning discharges of polluting substances, removing or damaging historical or cultural features, defense activities, and fish and plant

harvesting also resemble the proposed regulations of the preferred alternative, except that the prohibition on discharges applies to the much larger area of alternative 4, excluding the waters within 3 nmi of the mainland, and the other regulations cover the entire area encompassed by the boundaries for alternative 4.

The regulation for vessel traffic resembles that in alternative 3, except that it applies to the entire Channel.

In general, the increased areas of coverage would expand the level of environmental protection while only slightly increasing the costs and inconvenience to sanctuary users. Major costs are avoided by the exemptions which permit uses compatible with the sanctuary to continue. By exempting the State waters next to the mainland from the prohibition on discharges, the impositions of major costs on mainland dischargers is avoided.

The regulations for hydrocarbon operations and the provisions for management are discussed below.

Prohibited Activities

Hydrocarbon Operations

(a) Hydrocarbon exploration and exploitation pursuant to any lease executed prior to the effective date of these regulations and the laying of any pipeline is allowed except in vessel traffic separation scheme lanes and separation zones and within a quarter nautical mile of these lanes subject to all prohibitions, restrictions, and conditions imposed by applicable regulations, permits, licenses or other authorizations including those issued by the Department of the Interior, the Coast Guard, the Corps of Engi-

neers and the Environmental Protection Agency and subject further to the requirement that certain spill contingency equipment (see Section F.2.b.1) be available onsite for such operations.

(b) Hydrocarbon exploration and exploitation, activities within 6 nmi of the islands to leases executed on or after the effective date of these regulations are prohibited.

Within 6 nmi (11.1km) of the northern Channel Islands and Santa Barbara Island, alternative 4 has the same environmental consequences as the preferred alternative, except that development of existing leases is prohibited in the tanker lanes and separation zone and within one-quarter nmi (0.45km) of the lane. This provision affects development on tracts 203, 204, 205, and 210 within 6 nmi (11.1km) and development on certain leases including (202, 209, 221, 222, 223, 230A, 231, and 232) beyond 6 nmi (11.1km) from the islands which are traversed by the tanker lanes or separation zone.

NOAA's restriction on oil and gas exploration and extraction in and within 0.25 nmi (0.45km) of shipping lanes in the sanctuary is similar to the California Coastal Commission's (CCC) stated policy for consistency review that petroleum exploration within vessel traffic lanes or within 1650 ft. (500m) of them is inconsistent with the policies and objectives of the California Coastal Plan (California Coastal Commission, 1979). It is CCC policy that proposals not adhering to this policy cannot proceed. NOAA's restriction is also consistent with the special condition attached by the Army Corps of Engineers to Exxon's permit to anchor a drillship in navigable water for exploratory drilling on tracts 222, 223, 230, 231, 232, and 238. The special condition provided "(t) hat vessels shall not engage in drilling inside sea lanes or within one-quarter nmi (0.45km) of established sea lane boundaries" (California Coastal Commission, 1979). The purpose of

this prohibition is to eliminate the hazard of a collision or ramming and possible subsequent oil spills that the presence of a fixed structure within a designated vessel traffic lane or buffer poses to navigation.

Because this restriction is being implemented by the California Coastal Commission for all future development and by the Corps of Engineers on a case-by-case basis, NOAA's provision would not have any additional effects on operators. NOAA's provision would insure, however, that the California Coastal Commission's and Corps of Engineers' present policy is incorporated into a long-term management framework for the area.

NOAA's requirement for on-site oil spill containment equipment has the same environmental consequences as discussed in the preferred alternative and is applied for the same reason--to insure more effective at-sea oil spill containment. In alternative 4 however, this stipulation applies to all development around the Islands and in the Channel.

NOAA did not consider prohibiting all new oil and gas development in the area encompassed by alternative 4 because the evidence indicates that substantial economically recoverable petroleum reserves underlie the portions of the Channel near the mainland. The threats do not appear to warrant the sacrifice of these potential reserves located away from the most sensitive breeding and resting areas for seabirds and marine mammals.

Management

In addition to the provisions specified in the preferred alternative under alternative 4 the sanctuary manager will:

- Establish a Sanctuary Management Advisory Committee.

The environmental consequences of the management measures establishing a Sanctuary Information Center, promoting awareness of sanctuary resources, and encouraging scientific research are the same as discussed under the preferred alternative, except that they apply to a larger area. Efforts to inventory and map historical resources, coordinate with other activities, and maintain a research registry are also basically the same although a larger, more intensively researched, area is involved which will increase the scale of the effort.

The management measure of monitoring sanctuary resources and uses and working with other authorities would have all the environmental consequences described under the preferred alternative but would also have a regional management aspect. Under this alternative, monitoring and coordination provisions would afford sanctuary managers an opportunity to develop a broad regional perspective of ocean uses as they influence regionally significant natural marine resources. This regional perspective could then be used to guide decision-making concerning resource and use allocations throughout the Santa Barbara Channel region. With a broad overview of interactions between all significant uses, resources, and interests, the risks of hidden cumulative impacts could be highlighted, brought to the attention of appropriate authorities, and addressed.

The establishment of a Channel marine sanctuary advisory committee would insure a formal structure for cooperation between the sanctuary manager and other interested parties. The advisory committee would review and make recommendations on sanctuary management plans and decisions. Among the parties which might actively participate on the Committee would be representatives of the National Park Service, the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, the counties of Santa Barbara and Ventura, fishing and plant harvesting representatives, the Santa Barbara Museum of Natural History, the local Audubon Society, and The Nature Conservancy. Their participation would enable sanctuary managers to benefit from their broad spectrum of knowledge.

Comparison with the Preferred Alternative

In alternative 4, the sanctuary boundaries are extended to include the Santa Barbara Channel from Point Arguello to Point Mugu, as well as 12 nmi (22.2km) around the northern Channel Islands. This alternative is rejected in favor of the preferred alternative for several reasons. The justifiable regulations on overflights and alteration of or construction on the seabed are exactly the same as those discussed under the preferred alternative. The justifiable regulations concerning removing or damaging historical or cultural features, discharges of polluting substances, defense activities, and fishing and plant harvesting are also the same as under the preferred alternative, except that they would apply to a much larger area. Although the entire Santa Barbara Channel area is an interrelated ecosystem, most of the sensitive marine resources concentrate in the nearshore waters surrounding the islands. Evidence compiled to date does not indicate that such a

large boundary is needed to protect these resources; the preferred alternative appears adequate.

As noted in the preferred alternative, since vessels tend to adhere to the TSS anyway, an additional sanctuary regulation requiring such compliance seems unnecessary. This is particularly true since the preferred alternative includes a regulation prohibiting such vessels from entering nearshore waters within 1 nmi (1.8km) of any island. Protecting the resources from nearshore disturbances is more important to the purposes of the sanctuary than requiring vessels to remain within designated traffic lanes.

The regulation of hydrocarbon operations by alternative 4 is similar to the preferred alternative, except for the prohibition of development within the TSS. Since this requirement is already a policy of the California Coastal Commission and the Corps of Engineers, an additional regulation for the entire Channel is unnecessary. While extension of NOAA's oil spill containment equipment requirements to the entire Channel is desirable, this alone is not an adequate reason for extending the sanctuary boundaries beyond those in the preferred alternative, particularly because onsite equipment is slightly less crucial for platforms closer to the mainland, and thus to the locations of Clean Seas (Figure F-12).

As noted, the environmental consequences of most of the requirements specified under management are the same as those discussed under the preferred alternative except for the creation of an advisory committee.

The establishment of a formal advisory group would add a level of complication of the management of the marine sanctuary, perhaps not necessary or desired. Under the preferred alternative the sanctuary manager will be open to informal advice and comment from interested parties in any case.

ALTERNATIVE 5

Boundaries

The sanctuary boundary consists of the waters 3 nautical miles (5.6km) beyond the Territorial Sea (State waters) around the northern Channel Islands and Santa Barbara Island.

The 3-nmi (5.6km) "donut" around the northern Channel Islands and Santa Barbara Island excludes State waters. Hence, many of the habitats of valuable marine resources that concentrate in the upper shelf waters would not be included in the sanctuary.

The stated regulations concerning hydrocarbon development, discharges of polluting substances, vessel traffic and overflights, defense activities, and fish and plant harvesting, as well as the management provisions, are the same as those in the preferred alternative. Because of the exclusion of State waters from alternative 5, they offer less protection to the resources.

Alternative 5 would offer no protection from nearshore vessel traffic and overflights, from alteration of or construction on the seabed, or from damage or removal of historical or cultural resources. Also, because State waters are not included in this alternative, it is possible that oil and gas development could occur within the 3-nmi (5.6km) limit. This is not likely, however, particularly at San Miguel, Santa Cruz, Santa Rosa, and Anacapa Islands, since State Oil and Gas Sanctuaries have been established in the waters out to 3 nmi (5.6km) around these

islands. Within these sanctuaries, oil and gas development is prohibited, except in certain instances to allow a "drainage" sale to protect the State's economic interests. Since oil and gas development would be prohibited in adjacent Federal waters, it is unlikely that State petroleum resources will be drained.

However, because the waters around Santa Barbara Island have not been designated as a State Oil and Gas Sanctuary, oil and gas development could occur under the present management system. Alternative 5 provides no protection against this possibility.

Under alternative 5, littering and discharges could continue shoreward (in State waters) of sanctuary boundaries.

Under this alternative, management would focus attention on the waters extending 3 nmi (5.6km) beyond the territorial sea. As discussed in section E.2, the most important resource areas are in State waters over the island shelf area. Since these more valuable resource areas would be excluded from sanctuary boundaries, the nonregulatory management efforts involving research and public awareness would not be addressed to the most important resource areas.

Provisions to establish: (1) a Sanctuary Information Center, (2) an effort to promote sanctuary resources, (3) a registry of research projects, (4) a monitoring program for human uses and sanctuary resources, and (5) an effort to encourage non-consumptive research would be similar to those described under the preferred alternative, except they would apply to a smaller geographic area of less direct resource significance. In terms of research, the exclusion of State waters will significantly lower

the number of research projects subject to sanctuary management because: (1) the inshore waters (where marine life tends to concentrate) are attractive to a greater variety and number of research projects and (2) the geographic area is significantly smaller. The benefits of this alternative, while covering the same types of impacts described under the preferred alternative, will thus be considerably smaller both in terms of coordination and protection of marine life.

Since the sanctuary boundaries under this alternative almost exclusively include deeper waters where the likelihood of finding archeological resources is remote, initiation of a cultural resource inventory is not considered appropriate.

NOAA would seek cooperative agreements with appropriate State agencies to ensure that protective provisions applied in the sanctuary complement and further the resource protection objectives of the adjacent State waters. These agreements would be designed to coordinate State and sanctuary decision making and to reduce the potential that actions by either party would negate resource protection policies and objectives of the other.

Comparison with the Preferred Alternative

This alternative has been rejected in favor of the preferred alternative for the following reasons. First, in terms of the regulation of the discharge of polluting substances, the regulation as stated is the same, but no protection is provided the particularly important nearshore waters. The regulation provides a buffer from the potential impacts of oil and gas development on the Federal OCS, but does not insure that oil and gas development

is prohibited in State waters, particularly around Santa Barbara Island.

In terms of management, even with cooperative agreements with other agencies and the other sanctuary provisions relating to the information center, promoting awareness of sanctuary resources, registering research projects and encouraging nonconsumptive research, the failure to include the most important natural resource areas within sanctuary boundary compromises and restricts the potential that sanctuary designation will achieve long-term protection of critical resources.

ALTERNATIVE 6

Boundaries

The entire Santa Barbara Channel from Point Arguello to Point Mugu and 12 nautical miles around the northern Channel Islands and Santa Barbara Island, excluding State waters.

This "donut" sanctuary resembles alternative 4, but excludes all State waters -- i.e., all waters within the 3-nmi (5.6km) Territorial Sea. The remaining waters include portions of the forage and migration areas of important resources, yet leave out the vital waters overlying the upper island shelf. This boundary alternative is the same as that nominated by the County of Santa Barbara, California (Resources, 1978).

The regulations on discharges, and policies on defense activities, and fishing and plant harvesting would be the same as in the preferred alternative except that they would not apply in State waters and would apply throughout the Santa Barbara Channel (excluding territorial waters) and out to 12 nmi around the islands. They therefore, provide no direct protection for the nearshore resources.

Under alternative 6, NOAA would not regulate overflights or the alteration of or construction on the seabed because the exclusion of the nearshore waters renders such prohibition unnecessary.

The regulation concerning vessel traffic and hydrocarbon operations and management provisions are discussed below.

Hydrocarbon Operations

(a) Hydrocarbon exploration and exploitation pursuant to any lease executed prior to the effective date of these regulations and the laying of any pipeline is allowed except in vessel traffic separation scheme (TSS) lanes and separation zone and within a quarter nautical mile of these lanes, subject to all prohibitions, restrictions and conditions imposed by applicable regulations, permits, licenses or other authorizations including those issued by the Department of the Interior, the Coast Guard, the Corps of Engineers and the Environmental Protection Agency and subject further to the requirement that certain oil spill contingency equipment is available onsite for such operations.

(b) Hydrocarbon exploration and exploitation activities pursuant to leases executed on or after the effective date of these regulations are prohibited.

Beyond State waters, the environmental consequences of this regulation are the same as discussed under alternative 4. The environmental consequences of excluding State waters from regulation are discussed under alternative 5. As noted, it is possible that oil and gas development could occur within 3 nmi (5.6km) of the islands.

Operation of Vessels

Require U.S. flag and, to the extent consistent with international law, foreign flag vessels (except for fishing, kelp harvesting, military, research, enforcement, and recreational vessels) travelling parallel to established shipping lanes to remain in those lanes.

The environmental consequences of this regulation are similar to those discussed under alternative 4, except that there is no regulation prohibiting vessels within 1 nmi of the islands, which is the area most sensitive to disturbances from traffic. This is because these waters are not included in the sanctuary.

Management

In addition to the provisions specified in the preferred alternative, under alternative 6, the sanctuary manager will:

- Establish a Sanctuary Management Advisory Committee.

Nonregulatory management under this alternative represents a combination of attributes and deficiencies described under alternatives 4 and 5. It features a regionwide approach, but lacks authority in the most important natural resource areas--i.e., marine habitat over most of the island and mainland shelf areas.

Comparison with the Preferred Alternative

This alternative has been rejected in favor of the preferred alternative for the following reasons. The regulations for discharges of polluting substances are similar to those under the preferred alternative, but do not cover sensitive nearshore resources. Although the Santa Barbara Channel area is an integrated ecosystem, most of the sensitive marine resources concentrate in the nearshore waters surrounding the islands.

The alteration of and construction on the seabed, removal or damage of historic resources, the operation of vessels, and overflights may also continue in nearshore waters under this alternative. An adequate buffer from the potential impacts of oil and gas development in Federal waters is provided, but the continued protection of nearshore resources from oil and gas activities in State waters is not insured, particularly at Santa Barbara Island.

As in alternative 5, even with cooperative agreements with other agencies and the other sanctuary provisions, the management provisions fail to include the most important natural resource areas within the sanctuary boundary which compromises and restricts the potential that sanctuary designation will achieve long-term protection of critical sanctuary resources.

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I. APPENDICES

TITLE 15 - COMMERCE AND FOREIGN TRADE

CHAPTER IX - NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

PART 935 - THE CHANNEL ISLANDS MARINE SANCTUARY

AGENCY: National Oceanic and Atmospheric Administration (NOAA),
Department of Commerce

ACTION: Proposed Rule

SUMMARY: These regulations define permissible activities within the Channel Islands Marine Sanctuary, the procedures by which persons may obtain permits for prohibited activities, and the penalties for committing prohibited acts without a permit.

DATE: Comments due 60 days after publication in the Federal Register

ADDRESS: Send Comments to: Director, Sanctuary Programs Office,
Office of Coastal Zone Management, NOAA, 3300 Whitehaven Street, N.W.,
Washington, D.C. 20235.

PERSON TO CONTACT FOR FURTHER INFORMATION: JoAnn Chandler, Acting Director,
Sanctuary Programs Office, Office of Coastal Zone Management, NOAA,
3300 Whitehaven St. N.W., Washington, D.C. 20235. 202-634-4236.

SUPPLEMENTARY INFORMATION:

Title III of the Marine Protection, Research, and Sanctuaries Act of 1972, 16 U.S.C. 1431-1434 (the Act) authorizes the Secretary of Commerce, with Presidential approval, to designate ocean waters as far seaward as the outer edge of the Continental Shelf as marine sanctuaries to preserve or restore distinctive conservation, recreational,

ecological, or aesthetic values. Section 302(f) of the Act directs the Secretary to issue necessary and reasonable regulations to control any activities permitted within a designated marine sanctuary. The authority of the Secretary to administer the provisions of the Act has been delegated to the Assistant Administrator for Coastal Zone Management within the National Oceanic and Atmospheric Administration, U.S. Department of Commerce (the Assistant Administrator).

The Office of Coastal Zone Management proposes to designate as a marine sanctuary an area of the waters off the Coast of California, adjacent to the Northern Channel Islands, and Santa Barbara Island seaward to a distance of 6 nautical miles (nmi). The waters around these Islands, located in an area of upwelling and in a transition zone between the cold waters of the California Current and the warmer Southern California Counter Current, support an exceptionally rich and diverse biota, including one of the world's most diverse concentrations of marine mammals, several endangered species, and numerous seabirds; the area sustains a variety of human uses.

In 1977 NOAA received several recommendations for sanctuaries of varying dimensions to be established in the general area. NOAA held a public meeting in April 1978 to discuss these recommendations and in June 1978 the County of Santa Barbara submitted a nomination.

The Office of Coastal Zone Management prepared and issued an Issue Paper in December 1978 outlining alternatives for public review. Based on the responses to this Paper and consultation with other Federal

agencies, the Pacific Regional Fishery Management Council, State and local governments, and interest groups, NOAA prepared a draft environmental impact statement (DEIS) which is being published concurrently with these regulations. (A copy can be obtained by writing to the contact identified above).

The rationale for designation and for the proposed regulatory system as well as alternative approaches, both regulatory and nonregulatory are more fully set forth in the DEIS. OCZM will receive public comments on the proposal, hold public hearings in Santa Barbara and Ventura, California and prepare a final EIS and regulations which incorporate and respond to the comments received. Only after final consultation with Federal agencies, and with Presidential approval, can the Secretary designate the sanctuary and promulgate the regulations.

NOAA policy and its general Marine Sanctuary regulations (15 CFR Part 922, 44 F. Reg. 44831, July 31, 1979) provide that the regulatory system for a marine sanctuary will be established by two documents, a Designation document and the regulations issued pursuant to Section 302(f) of the Act. The Designation will serve as a constitution for the sanctuary, establishing among other things the purposes of the sanctuary, the types of activities that may be subject to regulation within it and the extent to which other regulatory programs will continue to be effective.

As proposed, the Channel Islands Marine Sanctuary Designation document would provide as follows:

Draft Designation Document

Designation Of The Channel Islands Marine Sanctuary

Preamble

Under the authority of the Marine Protection, Research and Sanctuaries Act of 1972, P.L. 92-532, (the Act) the waters surrounding the Northern Channel Islands and Santa Barbara Island are hereby designated a Marine Sanctuary for the purposes of preserving and protecting this unique and fragile ecological community.

Article 1. Effect of Designation

Within the area designated as The Channel Islands Marine Sanctuary (the Sanctuary), described in Article 2, the Act authorizes the promulgation of such regulations as are reasonable and necessary to protect the values of the Sanctuary. Article 4 of the Designation lists those activities which may require regulation but the listing of any activity does not by itself prohibit or restrict it. Restrictions or prohibitions may be accomplished only through regulation and additional activities may be regulated only by amending Article 4.

Article 2. Description of the Area

The Sanctuary consists of an area of the waters off the Coast of California, adjacent to the Northern Channel Islands and Santa Barbara Island seaward to a distance of 6 nautical miles (nmi). The precise boundaries are defined by regulation.

Article 3. Characteristics of the Area That Give it Particular Value

The Sanctuary is located in an area of upwelling and in a transition zone between the cold waters of the California Current and the warmer Southern California Countercurrent. Consequently, the Sanctuary contains an exceptionally rich and diverse biota, including 30 species of marine mammals and several endangered species of marine mammals and sea birds. The Sanctuary will provide recreational experiences and scientific research opportunities and generally will have special value as an ecological, recreational, and esthetic resource.

Article 4. Scope of Regulation

Section 1. Activities Subject to Regulation. In order to protect the distinctive values of the Sanctuary, the following activities may be regulated within the Sanctuary to the extent necessary to ensure the protection and preservation its marine features and the ecological, recreational, and esthetic value of the area:

- a. Oil and gas operations
- b. Discharging or depositing any substance or object
- c. Dredging or alteration of or construction on the seabed
- d. Navigation and operation of vessels other than fishing vessels and overflights below 1000 feet
- e. Removing or otherwise deliberately harming cultural or historical resources

Section 2. Consistency with International Law. The regulations governing the activities listed in Section 4 of this Article will apply to foreign flag vessels and persons not citizens of the United States only to the extent consistent with recognized principles of international law including treaties and international agreements to which the United States is signatory.

Section 3 Emergency Regulations. Where essential to prevent immediate, serious and irreversible damage to the ecosystem of the area, activities other than those listed in Section 1 may be regulated within the limits of the Act on an emergency basis for an interim period not to exceed 120 days, during which an appropriate amendment of this Article would be proposed in accordance with the procedures specified in Article 6.

Article 5. Relation to Other Regulatory Programs

Section 1. Fishing. The regulation of fishing is not authorized under Article 4. However, fishing vessels may be regulated with respect to discharges in accordance with Article 4, paragraph (b). All regulatory programs pertaining to fishing, including particularly regulations promulgated under the California Fish and Game Code and Fishery Management Plans promulgated under the Fishery Conservation and Management Act of 1976, 16 U.S.C. 1801 et seq. shall remain in effect and all permits, licenses and other authorizations issued pursuant thereto shall be valid within the Sanctuary unless inconsistent with any regulation implementing Article 4.

Section 2. Defense Activities. The regulation of those activities listed in Article 4 shall not prohibit any activity conducted by the Department of Defense that is essential for national defense or because of emergency. Such activities shall be conducted consistently with such regulation to the maximum extent practicable. All other activities of the Department of Defense are subject to Article 4.

Section 3. Other Programs. All applicable regulatory programs shall remain in effect and all permits, licenses and other authorizations issued pursuant thereto shall be valid within the Sanctuary unless inconsistent with any regulation implementing Article 4. The Sanctuary regulations shall set forth any necessary certification procedures.

Article 6. Alterations to this Designation

This Designation can be altered only in accordance with the same procedures by which it has been made, including public hearings, consultation with interested Federal and State agencies and the Pacific Regional Fishery Management Council, and approval by the President of the United States.

[End of Draft Document]

Only those activities listed in Article 4 are subject to regulation in the Sanctuary. Before any additional activities may be regulated, the Designation must be amended through the entire designation procedure including public hearing and approval by the President.

The primary purpose of the proposed regulations is to protect and to preserve the marine birds and mammals and their habitat and other natural resources of the waters surrounding the northern Channel Islands and Santa Barbara Island. This area supports a wide array of species partially because it is located in a transition zone between northern and southern waters and in an area of upwelling, and partially because it is one of very few areas on the Southern California coast that has remained relatively unaltered by human use. However, use of the Santa Barbara Channel is increasing and additional pressure is being placed on the resources from a number of human activities. Accordingly, those activities which pose a significant threat to the special marine features of these waters are prohibited. Such activities include:

discharges except for marine sanitation effluents, vessel cooling waters, fish cleaning wastes and chumming materials, and discharges incidental to allowed hydrocarbon operations (sec. 935.7(a)(1)); construction on or alteration of the seabed except for navigation aids or in connection with those hydrocarbon operations which are allowed under section 935.6 (Sec. 935.7(a)(2)); the unnecessary operation of vessels or aircraft in the vicinity of important habitats within 1 nmi of the islands and at lower than 1000 ft. in the case of aircraft (Sec. 935.7(a)(3)); and removing or harming of historical or cultural artifacts (Sec. 935.7(a)(4)). All prohibitions must be applied consistently with recognized principles of international law.

Hydrocarbon operations under existing leases may continue subject to conditions imposed by other authorities particularly the U.S. Geological Survey in its operating orders and the Environmental Protection Agency (EPA) through permits issued under section 402 of the Federal Water Pollution Control Act, 33 U.S.C. 1431, (known as NPDES permits) In addition, operators must maintain adequate oil spill contingency equipment on site. (Sec. 935.6(b)).

To reduce the possibility of damage to the resources by pollution, hydrocarbon exploration and exploitation under leases issued after the effective date of these regulations will be prohibited. (Sec 935.6(c)).

The regulation of fishing in the waters proposed for the Sanctuary will remain the responsibility of the California Department of Fish and Game, the Pacific Regional Fishery Management Council and the

National Marine Fishery Service pursuant to the Fishery Conservation and Management Act of 1976, 16 U.S.C. 1801 et seq. (See Article 5, Section 1 of the Designation) and no additional regulation of fishing has been proposed by OCZM. However fishing vessels are subject to the same discharge regulations as other vessels. (Sec. 935.7(a)(1).

PUBLIC REVIEW AND COMMENT:

NOAA invites public review and comment on these proposed regulations. Written comments should be submitted to: JoAnn Chandler, Acting Director; Sanctuary Programs Office; Office of Coastal Zone Management; National Oceanic and Atmospheric Administration; 3300 Whitehaven Street, N.W., Washington, D.C. 20235, on or before _ _ _ _ _ .

Samuel Lawrence
Administrator for Administration

Accordingly, Part 935 is proposed as follows:

PART 935 - THE CHANNEL ISLANDS MARINE SANCTUARY REGULATIONS

- 935.1. Authority.
- 935.2. Purpose.
- 935.3. Boundaries.
- 935.4. Definitions.
- 935.5. Allowed Activities.
- 935.6. Hydrocarbon Operations.
- 935.7. Prohibited Activities.
- 935.8. Penalties for Commission of Prohibited Acts.

935.9. Permit Procedures and Criteria.

935.10. Certification of Other Permits.

935.11. Appeals of Administrative Action.

935.1. Authority.

The Sanctuary has been designated by the Secretary of Commerce pursuant to the authority of section 302(a) of Title III of the Marine Protection, Research and Sanctuaries Act of 1972, 16 U.S.C. 1431-1434 (the Act). The following regulations are issued pursuant to the authorities of sections 302(f), 302(g) and 303 of the Act.

935.2. Purpose.

The purpose of designating the Sanctuary is to protect and preserve the the extraordinary ecosystem including marine birds and mammals and other natural resources of the waters surrounding the northern Channel Islands and Santa Barbara Island and ensure the continued availability of the area as a research and recreational resource. This area supports a particularly rich and diverse marine biota, partially because it is located in a transition zone between northern and southern waters and partially because it is one of very few areas on the Southern California coast that has been relatively unaltered by human use.

935.3. Boundaries.

The Sanctuary consists of an area of the waters off the coast of California adjacent to the following islands and offshore rocks: San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock extending

seaward to a distance of 6 nautical miles (nmi). The coordinates are in Appendix B.

935.4 Definitions.

(a) "Administrator" means the Administrator of the National Oceanic and Atmospheric Administration.

(b) "Assistant Administrator" means the Assistant Administrator for Coastal Zone Management, National Oceanic and Atmospheric Administration.

(c) "Person" means any private individual, partnership, corporation, or other entity; or any officer, employee, agent, department, agency or instrumentality of the Federal government, or any state or local unit of government.

935.5. Allowed Activities:

All activities except those specifically prohibited by sections 935.6. and 935.7. may be carried on in the Sanctuary subject to all prohibitions, restrictions and conditions imposed by any other authority.

935.6. Hydrocarbon Operations

(a) Hydrocarbon exploration and exploitation pursuant to any lease executed prior to the effective date of these regulations and the laying of any pipeline is allowed subject to paragraph (b) and all prohibitions, restrictions and conditions imposed by applicable regulations, permits, licenses or other authorizations including those issued by the Department of the Interior, the Coast Guard, the Corps of Engineers and the Environmental Protection Agency.

(b) No person may engage in any hydrocarbon operation

unless the following oil spill contingency equipment is available at the site of such operation.

- (1) 1500 feet of open ocean containment boom and a boat capable of deploying the boom:
- (2) one oil skimming device capable of open ocean use; and
- (3) fifteen bales of oil sorbent material.

(c) Hydrocarbon exploration and exploitation activities pursuant to leases executed on or after the effective date of these regulations are prohibited.

935.7. Prohibited Activities.

(a) Except as may be necessary for the national defense, in accordance with Article 5, section 2 of the Designation, or as may be necessary to respond to an emergency threatening life, property or the environment, the following activities are prohibited within the Sanctuary unless permitted by the Assistant Administrator in accordance with sections 935.9 or 935.10.

(1) Discharge of polluting substances.

No person shall deposit or discharge any materials or substances of any kind except:

- (A) indigenous fish or parts and chumming materials
- (B) effluents from marine sanitation devices
- (C) non-polluted cooling waters from vessels
- (D) effluents incidental to hydrocarbon exploration and exploitation activities as allowed by section 935.6.

(2) Alteration of or construction on the seabed.

Except in connection with hydrocarbon exploration or exploitation activities allowed by section 935.6, within 2 nautical miles of any island, no person shall:

- (A) construct any structure other than a navigation aid, or
- (B) drill through the seabed, or
- (C) Dredge or otherwise alter the seabed in any way

(3) Unnecessary operations of vessels and aircraft:

Except to transport persons or supplies to or from an island, or for enforcement purposes, no person shall, within 1 nautical mile of any island:

- (A) fly any aircraft at less than 1000 feet; or
- (B) operate any vessel unless engaging in activities directly associated with the resources of the area including but not limited to commercial or recreational fishing (in accordance with Article 5, section 1 of the Designation), research, sightseeing, and diving or other recreational activities, and the primary purpose of such vessel is to engage in such activities.

(4) Removing or damaging distinctive historical or cultural resources.

No person shall remove or damage any historical or cultural resource.

(b) All activities currently carried out by the Department of Defense within the Sanctuary are essential for the national defense and, therefore, not subject to these prohibitions. The exemption of additional activities having significant impacts shall be determined in consultation between NOAA and the Department of Defense.

(c) The prohibitions in this section are not based on any claim of territoriality and will be applied to foreign persons and vessels only in accordance with recognized principles of international law, including treaties, conventions and other international agreements to which the United States is signatory.

935.8. Penalties for Commission of Prohibited Acts.

(a) Section 303 of the Act authorizes the assessment of a civil penalty of not more than \$50,000 against any person subject to the jurisdiction of the United States for each violation of any regulation issued pursuant to the Act, and further authorizes a proceeding in rem against any vessel used in violation of any such regulation. Procedures are set out in Subpart D of Part 922 (15 CFR Part 922) of this chapter. Subpart D is applicable to any instance of a violation of these regulations.

935.9 Permit Procedures and Criteria.

(a) Any person in possession of a valid permit issued by the Assistant Administrator in accordance with this section may conduct any activity in the Sanctuary including any activity specifically prohibited under section 935.7 if such activity is either (1) research related to the resources of the Sanctuary, (2) to further the educational value of the Sanctuary, or (3) for salvage or recovery operations.

(b) Permit applications shall be addressed to the Assistant Administrator for Coastal Zone Management, Attn: Office of Sanctuary Programs, Division of Operations and Enforcement, National Oceanic and Atmospheric Administration, 3300 Whitehaven Street, N.W., Washington,

D.C. 20235. An application shall provide sufficient information to enable the Assistant Administrator to make the determination called for in paragraph (c) below and shall include a description of all activities proposed, the equipment, methods, and personnel (particularly describing relevant experience) involved, and a timetable for completion of the proposed activity. Copies of all other required licenses or permits shall be attached.

(c) In considering whether to grant a permit the Assistant Administrator shall evaluate such matters as (1) the general professional and financial responsibility of the applicant; (2) the appropriateness of the methods envisioned to the purpose(s) of the activity; (3) the extent to which the conduct of any permitted activity may diminish or enhance the value of the Sanctuary as a source of recreation, educational or scientific information; (4) the end value of the activity and (5) such other matters as deemed appropriate.

(d) In considering any application submitted pursuant to this Section, the Assistant Administrator may seek and consider the views of any person or entity, within or outside of the Federal Government, and may hold a public hearing, as deemed appropriate.

(e) The Assistant Administrator may, in his or her discretion, grant a permit which has been applied for pursuant to this Section, in whole or in part, and subject to such condition(s) as deemed appropriate. The Assistant Administrator or a designated representative may observe any permitted activity and/or require the submission of one or more reports of the status or progress of such activity. Any information obtained shall be made available to the public.

(f) The permit granted under paragraph (e) may not be transferred.

(g) The Assistant Administrator may amend, suspend or revoke a permit granted pursuant to this Section, in whole or in part, temporarily or indefinitely, if the permit holder (the Holder) has acted in violation of the terms of the permit or of the applicable regulations. Any such action shall be set forth in writing to the Holder, and shall set forth the reason(s) for the action taken. The Holder may appeal the action as provided for in 935.11.

935.10. Certification of Other Permits

All permits, licenses and other authorizations issued pursuant to any other authority are hereby certified and shall remain valid if they do not authorize any activity prohibited by section 935.6. Any interested person may request that the Assistant Administrator offer an opinion on whether an activity is prohibited by these regulations.

935.11. Appeals of Administrative Action

(a) Any interested person (the Appellant) may appeal the granting, denial, or conditioning of any permit under section 935.9 to the Administrator of NOAA. In order to be considered by the Administrator, such appeal shall be in writing, shall state the action(s) appealed and the reason(s) therefore, and shall be submitted within 30 days of the action(s) by the Assistant Administrator. The Appellant may request an informal hearing on the appeal.

(b) Upon receipt of an appeal authorized by this Section, the Administrator shall notify the permit applicant, if other than the Appellant, and may request such additional information and in such form

as will allow action upon the appeal. Upon receipt of sufficient information, the Administrator shall decide the appeal in accordance with the criteria set out in 935.9(c) as appropriate, based upon information relative to the application on file at OCZM and any additional information, the summary record kept of any hearing and the Hearing Officer's recommended decision, if any, as provided in paragraph (c) and such other considerations as deemed appropriate. The Administrator shall notify all interested persons of the decision, and the reason(s) therefor, in writing, normally within 30 days of the receipt of sufficient information, unless additional time is needed for a hearing.

(c) If a hearing is requested or if the Administrator determines one is appropriate, the Administrator may grant an informal hearing before a Hearing Officer designated for that purpose after first giving notice of the time, place, and subject matter of the hearing in the Federal Register. Such hearing shall normally be held no later than 30 days following publication of the notice in the Federal Register unless the Hearing Officer extends the time for reasons deemed equitable. The Appellant, the Applicant (if different) and, at the discretion of the Hearing Officer, other interested persons, may appear personally or by counsel at the hearing and submit such material and present such arguments as determined appropriate by the Hearing Officer. Within 30 days of the last day of the hearing, the Hearing Officer shall recommend in writing a decision to the Administrator.

(d) The Administrator may adopt the Hearing Officer's recommended decision, in whole or in part, or may reject or modify it. In any event, the Administrator shall notify interested persons of the decision,

and the reason(s) therefor in writing within 30 days of receipt of the recommended decision of the Hearing Officer. The Administrator's action shall constitute final action for the Agency for the purposes of the Administrative Procedures Act.

(e) Any time limit prescribed in this Section may be extended for a period not to exceed 30 days by the Administrator for good cause, either upon his or her own motion or upon written request from the Appellant or Applicant stating the reason(s) therefore.

APPENDIX 1.A: Coordinates of the Channel Islands Marine Sanctuary

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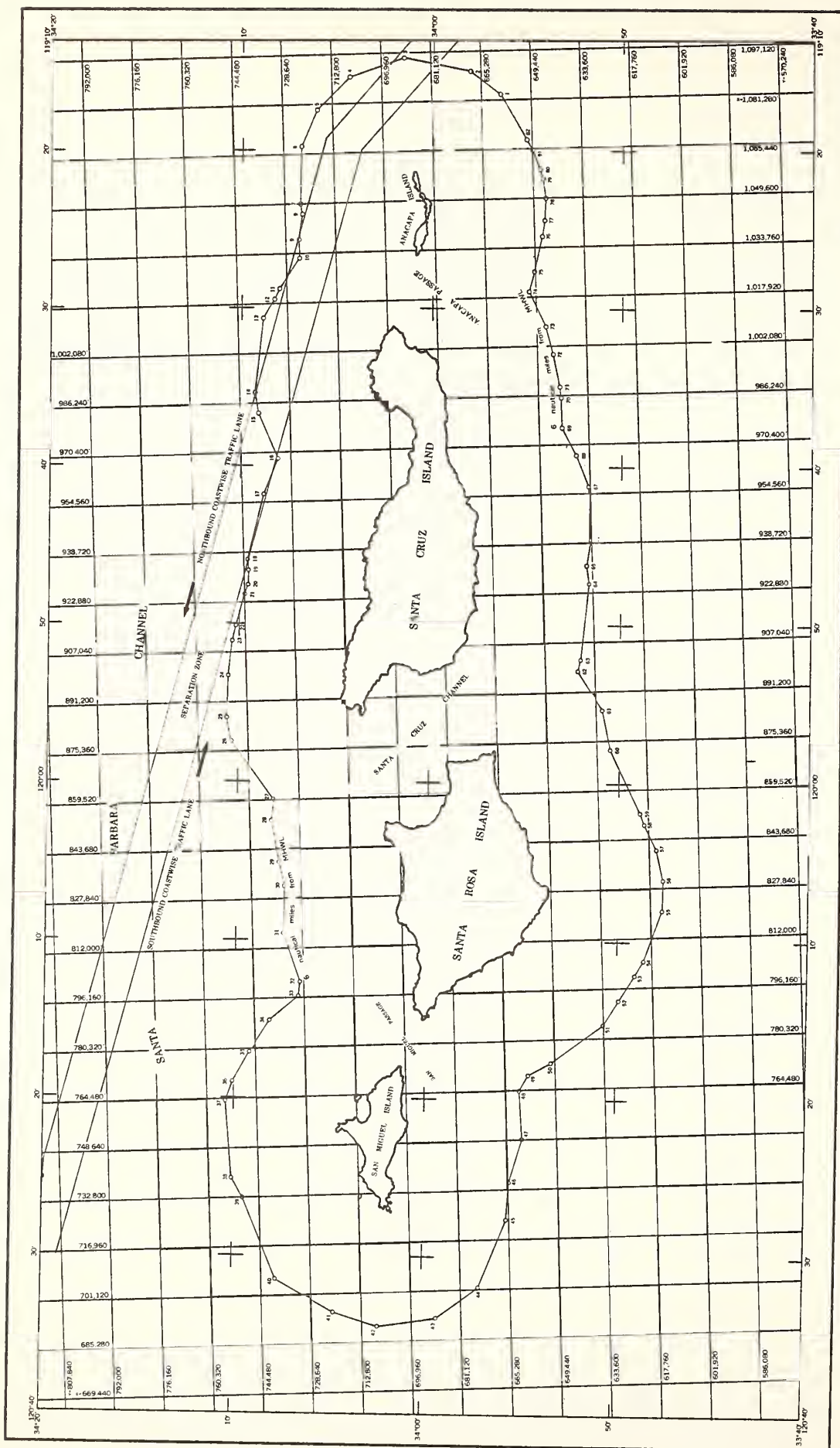
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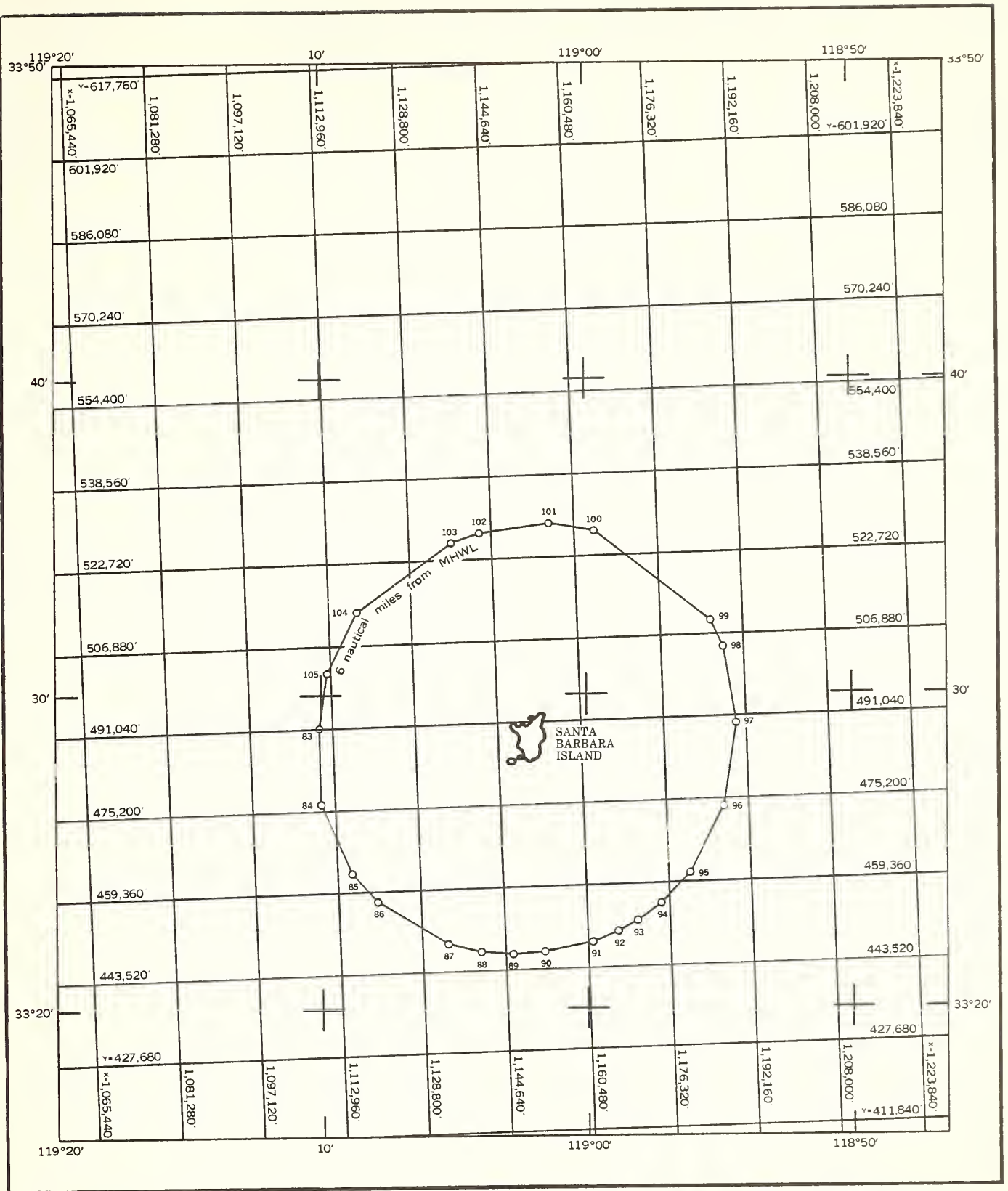
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49	335434.409	1201827.344
50	335323.129	1201739.927
51	335039.990	1201513.874
52	334953.260	1201341.904
53	3349 3.437	12012 6.750
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LATITUDE

LONGITUDE

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PREFERRED MARINE
SANCTUARY BOUNDARY
DIGITIZED POINTS — O —

APPENDIX 2. Fish and shellfish species of commercial and recreational interest in the waters around the northern Channel Islands and Santa Barbara Island (California Department of Fish and Game, in process).

Fishery Resources Listed on Atlas by Island

SAN MIGUEL

1. Mollusks in Rocky Areas:

Red Abalone	Black Abalone	White Abalone	Rock Scallop
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2. Kelp Bed & Rocky Bottom Fish:

Cabazon	Monkeyface Eel	Kelp Greenling	Lingcod
Black Rockfish	Black & Yellow Rockfish	Blue Rockfish	Copper Rockfish
Kelp Rockfish	Gopher Rockfish	Grass Rockfish	Olive Rockfish
Vermillion Rockfish	Yellowtail Rockfish	Blue Shark	Leopard Shark
Barred Surfperch	Black Surfperch	Pile Surfperch	Pile Surfperch
Rubberlip Surfperch	Striped Surfperch	Tomselt Surfperch	

3. Fish Over Shallow Sand Bottom; 0-18m (0-60 ft.):

N. Anchovy	Pacific Butterfish	Jacksmelt	Queenfish
White Seabass	Barred Surfperch	Pile Surfperch	Spinner Surfperch
Spotfish Surfperch	Rainbow Surfperch	Walley Surf- perch	White Surfperch
Tomselt	C-O Turbot	Horny Head Surfperch	

4. Fish Over Moderate Deep Sand Bottom; 18-46m (60-150 ft.):

Spiny Dogfish	Pacific Sanddab	Calico Rockfish	Halfbanded Rockfish
Stripetail Rockfish	English Sole	Sand Sole	Pink Surfperch
Shiner	Curlfin Turbot	Hornyhead Turbot	

5. Pelagic Fish Off This Coast:

Albacore	Northern Anchovy	Pacific Bonito	Pacific Hake
Jack Mackerel	King Salmon	Pacific Sardine	Pacific Saury
Blue Shark	Mako Shark	Thresher Shark	White Shark
Swordfish			

SANTA ROSA ISLAND

1. Mollusks in Rocky Areas:

Red Abalone	White Abalone	California Sea- mussel	Black Abalone
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Rock Scallop Piddocks

2. Kelp Bed & Rocky Bottom Fish:

Cabezon	Monkeyface Eel	Lingcod	Black Rockfish
Black & Yellow Rockfish	Blue Rockfish	Copper Rockfish	China Rockfish
Gopher Rockfish	Kelp Rockfish	Olive Rockfish	Yellowtail Rockfish
Blue Shark	Leopard Shark	California Sheephead	Black Surfperch
Pile Surfperch	Rubberlip Surfperch	Striped Surfperch	Tomsmelt

3. Fish Over Shallow Sand Bottom; 0-18m (0-60 ft.):

Anchovy	Leopard Shark	Rainbow Surfperch	C-O Turbot
Pacific Butterfish	White Seabass	Walleye Surfperch	Hornyhead Turbot

ANACAPA ISLAND

1. Mollusks in Rocky Areas:

Black Abalone	Pink Abalone	Rock Scallop	Red Abalone
White Abalone	California Mussel		

2. Kelp Bed & Rocky Bottom Fish:

Kelp Bass	Black Rockfish	Yellowtail Rockfish	Giant Sea Bass
Black & Yellow Rockfish	Blue Shark	Blacksmith	Brown Rockfish
Leopard Shark	Monkeyfaced Eel	Blue Rockfish	California Sheephead
Garibaldi	Copper Rockfish	Black Surfperch	Halfmoon
Gopher Rockfish	Pile Surfperch	Opaleye	Olive Rockfish
Rubberlip Surfperch	Kelp Rockfish	Striped Surfperch	Tree Rockfish
Tomsmelt			

3. Fish Over Shallow Sand Bottom; 0-18m (0-60 ft.):

Northern Anchovy	Pile Surfperch	White Surfperch	Pacific Butterfish
Rainbow Surfperch	Tomsmelt	Jacksmelt	Shiner Surfperch
C-O Turbot	Queenfish	Spotfin Surfperch	White Seabass
Walleye Surfperch			

4. Fish Over Moderate Deep Sand Bottom; 18-46m (60-150 ft.):

Spiny Dogfish	Stripetail Rockfish	Shiner Surf- perch	Pacific Sanddab
English Sole	Curlfin Turbot	Calico Rockfish	Sand Sole
Hornyhead Turbot	Halfbanded Rockfish	Pink Surfperch	

5. Pelagic Fish Off This Coast:

Albacore	Pacific Bonito	Pacific Saury	Mako Shark
Northern Anchovy	Jack Mackerel	Blue Saury	Thresher Shark
Pacific Hake	Pacific Sardine	Blue Shark	White Shark
Swordfish			

SANTA BARBARA ISLAND

1. Mollusks in Rocky Areas:

Black Abalone	White Abalone	Mussels	Red Abalone
Rock Scallop	Piddocks		

2. Kelp Bed & Rocky Bottom Fish:

Cabazon	Gopher Rockfish	Black Surfperch	Bat Rays
Monkeyfaced Eel	Calico Rockfish	Olive Rockfish	Pile Surfperch
White Seabass	Kelp Greenling	Squarespot Rockfish	Yellowtail Rockfish
Rubberlip Surfperch	Giant Sea Bass	Lingcod	Blue Shark
Striped Surfperch	Ocean Whitefish	Black Rockfish	Horn Shark
Sculpin	Black & Yellow Rockfish	Swell Rockfish	Tomsmelt
Blue Rockfish	Leopard Shark	Halfmoon	Copper Rockfish
California Sheephead	Opaleye		

3. Fish Over Shallow Sand Bottom; 0-18m (0-60 ft.):

Northern Anchovy	Barred Surfperch	Spotfin Surf- perch	Topsmelt
Pacific Butterfish	Pile Surfperch	Walleye Surf- perch	Jacksmelt
Rainbow Surfperch	White Surfperch	C-O Turbot	Queenfish
Shiner Surfperch	White Seabass		

4. Fish Over Moderate Deep Sand Bottom; 18-46m (60-150 ft.):

Spiny Dogfish	Halfbanded Rockfish	Sand Sole	Curlfin Turbot
Pacific Sanddab	Stripetail Rockfish	Pink Surfperch	Hornyhead Turbot
Calico Rockfish	English Sole	Shiner Surf- perch	

5. Pelagic Fish Off This Coast:

Albacore	Jack Mackerel	Mako Shark	Yellowtail
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Northern Anchovy	Pacific Sardine	Thresher Shark	Dogfish
Pacific Bonito	Pacific Saury	White Shark	Soupfin Shark
Pacific Hake	Blue Shark	Swordfish	
Jacksmelt	Pile Surfperch	White Surfperch	Queenfish
Shiner Surfperch	Tomsmelt	Speckled Sanddab	White Croaker
Island Surfperch			

4. Fish Over Moderate Deep Sandy Bottom; 18-46m (60-150 ft.):

Spiny Dogfish	Halfbanded Rockfish	Sand Sole	Curlfin Turbot
Pacific Sanddab	Stripetail Rockfish	Pink Surfperch	Hornyhead Turbot
Calico Rockfish	English Sole	Shiner Surfperch	Soupfin Shark
California Halibut			

5. Pelagic Fish Off This Island:

Albacore	Pacific Kake	Blue Shark	Swordfish
Northern Anchovy	Pacific Mackerel	Mako Shark	Mola
Pacific Bonito	Pacific Sardine	Thresher Shark	Jack Mackerel
Pacific Saury	White Shark		

(Commercial fishing close in for Abalone, Lobster, Squid)

SANTA CRUZ ISLAND

1. Mollusks in Rocky Areas:

Red Abalone	White Abalone	Rock Scallop	Black Abalone
Bay Mussel	California Sea Mussel		

2. Kelp Bed & Rocky Bottom Fish:

Cabezon	Copper Rockfish	California Sheephead	Monkeyfaced Eel
China Rockfish	Black Surfperch	Blacksmith	Kelp Rockfish
Kelp Rockfish	Kelp Greenling	Olive Rockfish	Pile Surfperch
Lingcod	Gopher Rockfish	Rubberlip Surfperch	Black Rockfish
Yellowtail Rockfish	Striped Surfperch	Black & Yellow Rockfish	Blue Shark
Tomsmelt	Blue Rockfish	Leopard Shark	Garibaldi
Grass Rockfish	Opaleye	Kelp Bass	

3. Fish Over Shallow Sand Bottom; 0-18m (0-60 ft.):

Northern Anchovy	Barred Surfperch	Rainbow Surfperch	Pacific Butterfish
Calico Surfperch	Walleye Surfperch	Jacksmelt	Pile Surfperch

White Surfperch	Queenfish	Shiner Surf- perch	Tomsmeit
White Seabass	Island Surfperch	C-O Turbot	Grunion
Spotfin Surfperch	Hornyhead Surfperch	Speckled Sanddab	

4. Fish Over Moderate Deep Sandy Bottom; 18-46m (60-150 ft.):

Spiny Dogfish	Stripetail Rockfish	Shiner Surf- perch	Pacific Sanddab
English Sole	Curlfin Turbot	Calico Rockfish	Sand Sole
Hornyhead Turbot	Halfbanded Rockfish	Pink Surfperch	

5. Pelagic Fish Off This Island:

Albacore	Pacific Mackerel	Thresher Shark	Northern Anchovy
Pacific Sardine	White Shark	Pacific Bonito	Pacific Saury
Swordfish	Pacific Hake	Blue Shark	Mola
Jack Mackerel	Mako Shark	Opah	

APPENDIX 3: Brief Review of the Outer Continental Shelf (OCS) Oil and Gas Development Process

In virtually all instances, the pattern of OCS oil and gas development follows the same basic steps: 1) pre-exploration, 2) leasing, 3) exploratory drilling, 4) development drilling, 5) production, and 6) completion. During pre-exploration activity, oil companies send research vessels to conduct seismic surveys of an area to determine the geologic structure and location of potential petroleum bearing strata. Since OCS lands are federally owned, oil companies must first secure the right to drill and exploit the natural resources before any drillings can be conducted. Drilling rights on the OCS are obtained by leasing areas (called blocks or tracts) from the responsible federal agent -- the Bureau of Land Management (BLM). The oil companies nominate for lease sale those tracts which they view as promising and bid on those tracts in a competitive bid lease sale. BLM reviews the highest bids and may accept or reject them. If the high bids are deemed commensurate with the resource potential, the company is granted a lease to drill and develop the block.

Upon award of a lease, exploratory drilling from a drilling "rig" may be conducted to determine the precise location, extent, and quantity of oil and gas resources. This involves drilling an average of about four exploratory wells per tract from a movable, temporary rig. If an exploratory well indicates the presence of petroleum hydrocarbons, additional wells are drilled to determine the areal extent of the reservoir(s) and to aid in locating the optimal site for production platforms. After exploration is complete, but before commercial production can begin, a development plan must be prepared by the developer and submitted for approval to the U. S. Geological Survey (USGS). The USGS reviews this plan to insure that safety and environmental standards are met.

After approval of the development plan, production "platforms" are installed on the tract and development wells are drilled. A tract with a high resource potential might include two platforms and approximately 40 wells. Production "platforms" are more permanent structures than drilling "rigs" since they must serve throughout the production life of the field (which may be 15 to 40 years) and withstand the rigors of even the most severe ocean storms. In addition to platforms, production facilities normally include transportation systems to shore and onshore processing and storage plants.

After all recoverable oil and gas resources have been exploited, the well is closed below the sea floor and the platform and pipelines are removed.

APPENDIX 4: BLM Special Stipulations for OCS Sale #48 (U. S. Bureau of Land Management, 1979).

Stipulation No. 1. Department of Defense restriction

Requires lessee and/or operator to coordinate boat and aircraft traffic with appropriate military commander; provides for temporary suspensions of OCS operations, and requires control of electromagnetic emissions.

Stipulation No. 2. Department of Defense restriction

Indemnifies and saves harmless the United States against claim for injury or damage from space and missile testing.

Stipulation No. 3. Cultural Resources

Requires surveys to identify resources of historical or archaeological significance, and subsequent protection.

Stipulation No. 4. Trawl grounds

Requires that protrusions above the sea floor, and irregular pipe surfaces, be protected by shrouds which will prevent damage to the structures, or fishing gear.

Stipulation No. 5. Areas of special biological interest

Requires prevention, to the maximum extent possible, of detrimental impact upon areas of special biological interest.

Stipulation No. 6. Transport of oil and gas

This stipulation establishes regional and state working groups, consisting of federal, state, and local government, and industry representation, to formulate regional transportation management plan recommendations.

Stipulation No. 7. Tanner-Cortes Banks

To mitigate the impacts of physical disruption and sedimentation on significant biological communities of Tanner-Cortes Banks.

APPENDIX 5: Summary of USGS Pacific OCS Orders and Notices to Lessees (U.S. Bureau of Land Management, 1979).

Pacific Area OCS Order No. 1

This Order requires all platforms, drilling rigs, drilling ships, and wells to have standard signs identifying the operator, the specific lease block of operation, and well number.

Pacific Area OCS Order No. 2

Order No. 2 concerns procedures for drilling of wells. In requires the operators to file an application for drilling which includes information on the drilling platforms or vessel, casing program, blowout prevention equipment, well control training and safety training of operators' personnel, and a list or description of critical drilling operations.

Pacific Area OCS Order No. 3.

This Order is established to provide regulation of plugging and abandonment of wells which have been drilled for oil and gas. For permanent abandonment of wells, cement plugs must be placed so as to extend 30m (100 feet) above the top and 30m (100 feet) below the bottom of fresh water, oil, and gas zones to prevent those fluids from escaping into other strata. Portions of a well in which abnormal pressures are encountered are also required to be isolated with cement plugs. Plugs are required at the bottom of the deepest casing below which an open hole exists. Plugs or cement retainers are required to be placed 30m (100 feet) above the top and 30m (100 feet) below any perforation interval of the well hole used for production of oil and gas.

Pacific Area OCS Order No. 4

An OCS lease provides for its extension beyond its primary term for as long as oil or gas may be produced in paying quantities provided the operator has met the requirements for diligent development. If these circumstances should occur, the lease can be extended beyond its initial term, pursuant to Section 8(b)(2) of the OCS Lands Act and Title 30 CFR 250.11 and 250.12(d)(1). In addition, an OCS lease may be maintained beyond the primary term, in the absence of actual production, when a suspension of production has been approved by the Supervisor. Order No. 4 defines the conditions and requirements for such suspensions.

Pacific Area OCS Order No. 5

This Order sets regulations for the installation, design, testing, operation, and removal of subsurface safety devices.

Pacific Area OCS Order No. 6

This Order pertains to procedures for completion of oil and gas wells. Wellhead equipment such as casing-heads, wellhead fittings, valves and connections are specified and rating requirements are noted here. Testing procedures for wells and subsurface safety devices are also specified in the Order along with methods for multiple or tubingless completions.

Pacific Area OCS Order No. 7

Order No. 7 concerns the control or pollution to the marine environment and provides regulations for the disposal of waste materials generated as a result of offshore operations.

Pacific Area OCS Order No. 8

This Order requires that platforms, fixed structures, and artificial islands be designed with consideration for geological, geographical, environmental and operational conditions. Prior to structural approval by the Supervisor, detailed design and stress load data must be submitted to the USGS. Certification of structural adequacy by a registered professional engineer is required by the Order.

Pacific Area OCS Order No. 9

OCS Order No. 9 provides approval procedures for oil and gas pipelines on the OCS. All pipelines and related equipment must be designed and maintained with high-low pressure sensors, automatic shut-in valves, checkflow valves (to control backflow), and metering systems to detect input/output variances (leakage). The Order also requires adequate provisions for cathodic corrosion protection, trawling compatibility, hydrostatic testing, storm scour and other environmental stress in OCS pipelines. Procedures and schedules for regular inspection of pipelines along with recording of such inspections are stipulated.

Pacific Area OCS Order No. 10

OCS Order No. 10 provides for drilling twin core holes located adjacent to core holes drilled on the OCS under earlier California State authorization. Such holes were drilled prior to the establishment of Federal authority beyond the 3-mile limit.

Pacific Area OCS Order No. 11

This Order provides for prevention of waste, conservation of oil and gas resources, and protection of correlative rights by defining and setting standards for rates of production, production testing procedures, and joint production requirements.

Pacific Area OCS Order No. 12

The purpose of this Order is to make the records of the Department of the Interior available to the public to the greatest extent possible.

Notice to Lessees No. 77-1. "Applications for exploratory operations"

This NTL summarizes the requirements and instructions relative to the approval of applications for a permit to drill exploratory wells.

Notice to Lessees No. 77-2 "Minimum requirements for shallow drilling hazard surveys"

Minimum requirements of geologic hazard surveys, which must be conducted pursuant to 30 CFR 250.34(a), are described.

Notice to Lessees No. 77-3. "Minimum cultural survey requirements"

Describes necessary measures to be taken to identify and preserve all Federally-owned sites, structures, and objects of historic, architectural, or archeological significance as directed by Executive Order No. 11593.

Notice to Lessees No. 77-4. "Minimum requirements for biological surveys"

Requires a plan of survey to identify significant biological communities.

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